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JAMES P. PORTER, *Editor*
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MAY SUKOV AND E. G. WILLIAMSON. Personality Traits and Attitudes of Jewish and Non-Jewish Students

ARTHUR KOLSTAD. Employee Attitudes in a Department Store

ROSE G. ANDERSON. Some Technological Aspects of Counseling Adult Women

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SOME TECHNOLOGICAL ASPECTS OF COUNSELING ADULT WOMEN[1]

ROSE G. ANDERSON
Psychological Service Center of New York

PART I

AMONG the measures used in an individual counseling project carried out for a women's[2] organization were the Bernreuter Personality Inventory and the Allport Study of Values. The results for these two measures are here analyzed with respect to their contributions and limitations in personal counseling of adult women. The primary aim of the counseling was to assist in the vocational readjustment of employees of the organization who had lost or were about to lose their positions. In a majority of cases the ostensible reason for dismissal was the curtailment of funds during the depression.

In addition to a variety of objective measures of ability, personality, and interest, and the individual's own personal statements, it was possible to examine confidential credentials for each woman counseled. These credentials included detailed statements from university instructors, employers and employees, co-workers, and personal acquaintances over the entire training and work-experience period. The individuals ranged in age from the early twenties to the late fifties, half of them falling between thirty-three and forty-four years of age.

A comparison was made of the individual's results on the above measures with the indications of the presence or absence of the traits measured in (a) the theoretical expectations resulting from the individual's choice of and selection for the field of work in which she was engaged, (b) in the statements in her credentials and in her own discussion of herself.

[1] Read in abbreviated form at the 1938 meeting of the A.A.A.P., Columbus, Ohio.

[2] The National Association of Employed Officers of the Y.W.C.A.

The search for confirming or conflicting evidence in the credentials naturally presented difficulties. In the first place the same characteristics are not always considered in the two sources of information. Secondly, the connotation of terms may differ widely, the lay use of the term having little in common with the scientific connotation. For example, in going through the papers for evidence on emotional stability, it is apparent that this term is frequently used as a blanket statement to cover any difficulty in getting along with other people. In one case important evidence presented in support of this classification was the stubborn refusal of the worker to put on a smock while holding interviews in her office between swimming classes. Other difficulties are the variation in subjective standards, the distortion of judgments as a result of the personal relationship between the worker and the individual reporting on her, the halo effect of the "rare" personality, the wholesale condemnation of an individual because of one more or less conspicuous shortcoming.

It should be obvious that the peculiar qualifications of the investigator in this instance are those of the sleuth. Hence, the confirming evidence is often arrived at by indirection and induction. Fortunately the statements covered a long enough period and were contributed by a sufficient range of individuals so that significant evidence could be culled from the papers in most instances.

Anyone at all familiar with the activities and aims of the organization will admit that a positive degree of each of the four traits measured by the personality inventory is among the desirable qualifications of workers in this field.[3] Several factors would tend toward a predominance of such workers having these characteristics. The natural attractiveness of the work to individuals of this combination of personality traits would tend to their gravitation towards it. Further, the selection by the personnel bureau would tend toward elimination

[3] *Cf.* publications of Leadership Division of Y.W.C.A. *re* qualifications for *Girl Reserve Secretary, Industrial* and *Business Girl's Secretary,* etc.

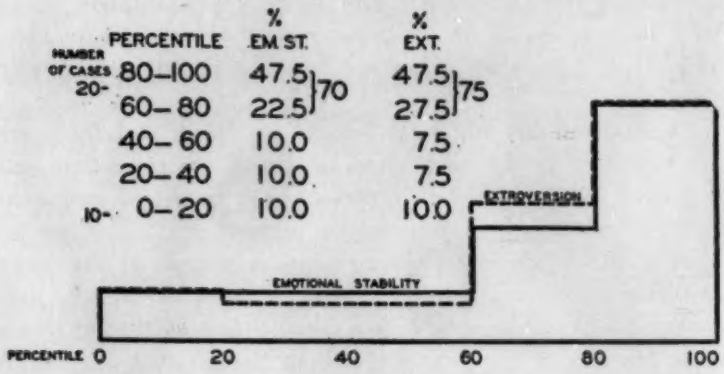
of those who did not have these qualifications. Further elimination would occur among those leaving the work because of dissatisfaction or unfitness. The theoretical expectation would be a preponderance of emotionally well adjusted and extroverted individuals who are strongly self-sufficient and socially dominant.

Throughout this study the results for B1–N and B3–I are not expressed in the usual terms of degree of neuroticism and degree of introversion but in terms of the degree of emotional stability and degree of extroversion respectively. This has become a convention in consulting practice because of the desirability of expressing results in positive terms. It is, e.g., psychologically more acceptable to a client to be told that he excels some fraction of the population, even though that fraction is small, in a trait considered desirable than to be told that he exceeds a large fraction of the population in a trait considered less desirable. To be specific, if an individual's score was at the 70 percentile for neuroticism, it has been converted into the 30 percentile for emotional stability. Likewise, if it was at the 80 percentile for introversion it has been converted into the 20 percentile for extroversion. Therefore, high percentiles indicate a positive showing in the case of all four traits expressed in positive terms.

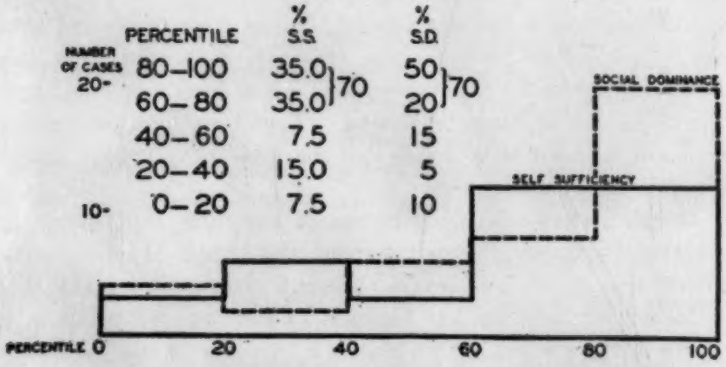
Graph I shows the distribution of the forty individuals in emotional stability and extroversion and Graph II in self-sufficiency and social dominance. Chart I shows the original distribution by code number for each of the four traits for each of the forty women. This makes it possible to compare each individual's placement in the various traits. These graphs supply striking evidence of the type of selection indicated in that no less than 70 per cent of the forty women exceed the 60 percentile in each of the four traits. From this it does not necessarily follow that these 70 or more per cent of women are successful secretaries. The indication is rather that those who fall at the other end of the distribution are less well adapted *by personality* for such work.

GRAPH-I

BERNREUTER PERSONALITY INVENTORY



GRAPH – II



In the consideration of individual cases two criteria are important, the degree of success in the work and the cost to the individual in terms of effort, strain, personal satisfactions, etc. The point of view of counseling is that the individual should be assisted to find the vocation or vocations into which he will fit most naturally on the basis of his own makeup and the kinds of satisfactions which are important to him. Often, recognized

success is possible and has been attained in spite of liabilities because of compensatory qualities offsetting the former, but often also at the expense of considerable strain and satisfaction. In evaluating these cases therefore both criteria must receive consideration.

We will first consider three individuals who fall at or below the 20 percentile in all four traits. Two of these, numbers 16 and 33, are similar in nature. Both are women sincerely interested in the 'cause' with high standards of performance. In the case of both there is definite confirmation of lack of social dominance and of introverted tendency. In neither is there any indication that their own problems of emotional adjustment have made it difficult for others to get along with them. In the case of both there is evidence of consideration for others' feelings and tact in dealing with them. It has been recognized that an emotionally hypersensitive person who has insight into this characteristic may use it as an asset. There is evidence that this has been done in both of these cases. There is no direct evidence as to self-sufficiency, except that the personal history of one is such as to contribute toward a lack of this. There is much indirect evidence on this point and on the general point that these two women were not well adapted to the work they were doing. Part of this is found in the number of statements made about both women of a compensatory nature, statements which are not likely to appear in the papers of those doing an unqualifiedly successful piece of work.

For example, in the case of one of them the following statements are included: "plucky, courageous, not afraid of a hard job, earnest, careful, steady (three times), faithful, dependable (two times), conscientious (four times), hardworking, thorough." We have a picture of an individual endeavoring to put her job through without regard to the cost to herself and at a very great cost to herself. That she had compensatory qualities in intelligence, judgment, superior training, religious values, etc., had made it possible for her to achieve a measure of success and a good deal of appreciation. In the case of both,

however, their associates and the personnel division had reservations with regard to further placements.

The case of a third (No. 2) is of a quite different nature. In this case the results of the inventory are in distinct conflict with the impressions of those who have known her. Statements about her include the following: "one of the finest association secretaries I have ever known," "no secretary more endeared to her co-workers and to the girls of the Association," "wins confidence of all who know her," "an inspiration to her committee and advisors," "unusual initiative," "exceedingly well poised." The question is at once raised how the two extreme impressions can be reconciled. Her own personal statement more than confirms the personality findings. Among her statements are: "a feeling of inadequacy aggravating discontent with all phases of my life," "I don't quite hit the mark in anything," "not resourceful in suggestions and ideals beyond a very limited scope," "became tired and melancholy because of worry of not being able to hold my job," "I can't keep up with it (my work); I want to run away from it all." There is much more of this. The trend indicates an individual forcing herself to make adaptations which are not the most natural for her and succeeding even brilliantly as far as external impressions are an indication, but at a grave cost to her own mental health. Only one statement in her papers provides a clue to this situation, the following "an indefatigable worker—her one fault." Part of her problem is her tendency to make moral issues of what she considers her shortcomings and to inflict self-punishment and self-recrimination. This condemnation includes members of her family who suffer the same "defects," she feels.

The fourth individual (No. 19) who falls below the 20 percentile in extroversion and emotional stability, is above the 90 percentile in both degree of self-sufficiency and in social dominance. In all respects these findings are confirmed by other parts of the study and by confidential material. She is highly intelligent, and has been very successful in phases of her work. In these the contribution of her dominant and self-sufficient

personality combined with a charming manner, attractive appearance and high level of ability are apparent. Our observation has shown that a high degree of self-sufficiency and social dominance may operate as liabilities. That this has in a measure been true in this case is indicated by such statements as "inflexibility—will hold firmly to an idea over a month," "determination to carry out her point to the point of heartlessness," "not always tactful particularly if disagrees." The two latter also provide a clue as to her lack of interest in and failure to understand people. Theoretically at least the introverted person is not so sensitive to the feelings and mental reactions of others. Other statements which lend confirmation to the rating for introversion are the following: "didn't sense situations," "didn't take her board into her confidence." Associates felt they could not get "near" her and her board did not understand her. This lack of interest in people and in social values was fully confirmed by her own statements and by her ratings on the Allport Scale of Values. She herself, however, was reported to be sensitive. The general impression gained here is such as to confirm the low ratings for introversion and emotional stability and points to these as factors in accounting for her stated lack of satisfaction in her work and to a lesser degree of success in phases of her work which finally led to a request for her resignation.

The fifth individual (No. 21) falls below the 30 percentile in emotional stability. This finding has been confirmed by such statements as "not particularly happy disposition which a difficult situation accentuates," "not poised in many situations," "took situations too seriously," "inclined to see disadvantages out of proportion," "always questioning satisfactions." She fell in the same position in introversion and only slightly higher in social aggressiveness. These findings receive confirmation in the facts that she did not do strong work in developing committees or in making her influence felt in the community. She was likely to make up the background and be a good listener rather than a contributor at committee meetings.

She was above the 80 percentile in self-sufficiency. She is characterized as being "tenacious in her own ideas."

The individuals discussed include those who fell below the 30 percentile with a few exceptions, one is below this point in self-sufficiency and social dominance and another in social dominance only. Two fall below in extroversion. It is impossible to discuss each case in detail, but similar confirmation could be presented.

Before leaving this phase of the discussion of the personality inventory, some consideration should be given to the meaning of "emotional stability" as measured by the scale. What the scale aims to measure is the tendency to neuroticism. However, it is customary to express measurements on the scale in positive terms. Emotional stability has been used as a convenient term to express the positive trait. Actually this term is misleading and should be supplemented by one which more exactly describes the quality measured. According to Warren's definition "emotional stability is liability to excessive, quickly changeable, and therefore inappropriate display of emotion." An examination of the 23 items which are most significant in the score for emotional stability shows that not over four of them refer to overt display of emotion and not over one to changeability in display of emotions. The great majority are with respect to degree and kinds of personal sensitivity which may or may not be apparent to observers or associates and which may or may not affect the overt relationship with associates. However, if these "sensitive spots" are present beyond a certain extent and degree, the situation then is that the individual's energies and attention are so absorbed by his own problems or so turned in on himself that they can only by deliberate effort be directed outward and be made available for his understanding of and adjustments to other people.

How the effect of this varies in different individuals has been apparent in the cases discussed. In all five the evidence of extra strain and effort has been apparent. In the second case discussed the indication was that customary reserves had been

exhausted so that an extra emotional strain was more disrupting than it would ordinarily be. In three there was evidence that it had resulted in personality clashes.

Turning for a moment to the consideration of those who fall in the upper thirty per cent in emotional stability, the personnel files disclose that the question of emotional stability has been raised in the case of four of these twenty-seven women. In one of these, No. 20, the evidence indicates emotional immaturity rather than instability. In a second, No. 18, the entire record previous to the raising of this question indicates a well-adjusted individual, "poised, wholesome, very happy nature, sense of humor, works harmoniously with others, very cheerful." Health problems were a contributing factor to difficulties of adjustment at the time the question of emotional instability was raised. The trend of the evidence seems to indicate that the latter is not a primary factor. A statement from her quotes the psychiatrist with whom she has been consulting over a period as follows: "The findings . . . fit into her understanding of my reactions."

A third individual (No. 28) in this group has been handicapped in several respects in maintaining her position with staff workers. The indications are that she is not so keen mentally as they, she lacks the academic training they have had, her social viewpoint is not well developed, her loyalties have been inclined to be personal, she is not strong in self-sufficiency and has attempted to maintain her position through domination of others. Her personal history reveals that this tendency developed as a constructive adaptation in asserting her personality as a girl. In recent years it has become an increasing handicap. Although there were emotional flare-ups at critical times, they appear to be secondary to other factors rather than reflecting a primary emotional instability.

The fourth individual (No. 17) has apparently made a better adjustment in recent years. Statements made about her at the time she was discouraged from continuing in Y.W.C.A. work because of emotional instability indicate general immaturity

rather than instability. Her personal history reveals insufficient preparation in personality development, human relationships and practical experiences for assuming the responsibilities of her position.

In the case of a fifth individual (No. 26) a personal problem specific in cause but serious in its implications was revealed in the personal interview. A conclusion drawn from the few significant items answered unfavorably would be definitely misleading in this case. This case and the others discussed show that it is not safe to assume that a high degree of emotional stability as measured by this inventory insures an absence of problems of personal adjustment. Nor is it safe to generalize from the *number* of significant replies without investigating the *degree* of their significance to the individual. A few significant items may be so emotionally charged and so far-reaching in their ramifications that the effect is far more disrupting and energy-consuming than a larger number more superficial in significance.

No statistical comparison has been made as to the extent to which the possession of these four traits in positive degree corresponds with recognized success in the work under consideration. The tendency for the group is obvious. The individuals who fall at the opposite extreme in these traits are the relatively less successful, especially those who are low in all four traits. However, a small proportion of those who have a high degree of all four traits have also been unsuccessful. Since these traits are only a few among many factors, the possession of them is not a guarantee to success and should not be expected to be.

The individual cases discussed illustrate Allport's[4] statement that, "in every day life, the single functions which individuals have in common are deeply overshadowed by the use to which they put these functions." It is the patterning of individual functions in the individual case which is the significant thing.

It follows then that it is impossible to generalize from the degree of a trait present, how this trait will affect the individ-

[4] Allport, Personality, Henry Holt & Company, No. 37, pp. 4, 10, 23.

ual's adjustment. In order to make such an interpretation these results must be interpreted against the personal history of the individual, the total picture of his assets and liabilities, his needs for recognition and acceptance, his intellectual and emotional drives, the adequacy of his behavior patterns and the need for compensations, his insight into his own motivations and satisfactions and how they affect both his attitudes and his overt response to people, etc. Interpreted in this way these results add significantly to the understanding of the individual.

PART II

We pass now to a consideration of the Allport Scale of Values.

Again it is interesting to check theoretical expectations against actual results. Of these six values it would be expected that social values would be relatively high. Significant social values might, however, result in the individual's choice of other phases of social work instead of Y.W.C.A. work. The additional factor determining the choice of the latter would be a strong religious interest value in addition.

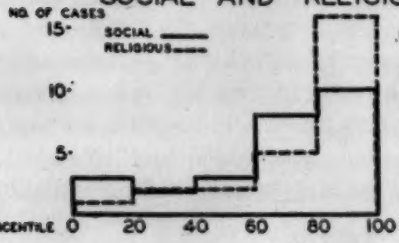
Graphs III to V show the distribution of 26 secretaries for these values. Graph III shows significantly high trends for social and religious values, Graph IV equally significantly low trends for economic and political values, and Graph V shows great individual variation in theoretical and aesthetic values. This measure was included after the first group had been counseled. In view of the smaller number of individuals included the results are significant. That 81 per cent of this group show significantly high interest drives for religious values, and 69 per cent for social values is impressive confirmation of theoretical expectations and indicates that this measure is practically useful in providing clues as to the agreement between the interest drives of individuals considering this work and the interest drives finding expression and satisfaction in the work.

Again the consideration of exceptional cases adds further information on this point and on the contribution to the understanding of the individual.

GRAPH-III

ALLPORT STUDY OF VALUES

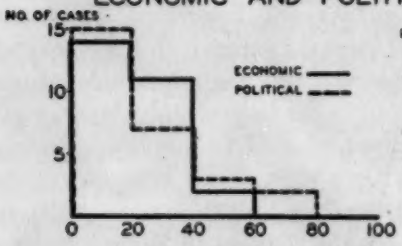
SOCIAL AND RELIGIOUS VALUES



PERCENTILES	SOCIAL %		RELIGIOUS %	
80–100	38.0	69.0	62.0	81.0
60–80	31.0		19.0	
40–60	11.5		8.0	
20–40	8.0		8.0	
0–20	11.5		4.0	

GRAPH-IV

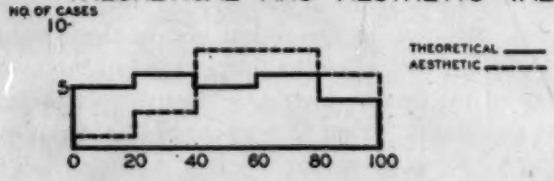
ECONOMIC AND POLITICAL VALUES



PERCENTILES	SOCIAL %		RELIGIOUS %	
80–100	50.0	92.0	54.0	81.0
60–80	42.0		27.0	
40–60	8.0		11.5	
20–40	0		8.0	
0–20	0		0	

GRAPH-V

THEORETICAL AND AESTHETIC VALUES



The individual showing the relatively lowest rating for social interest values has already been discussed, No. 19. Her low rating in this respect is in complete agreement with her rating for extroversion on the Bernreuter and also with her own statements as to satisfactions from her work and problems with respect to maintaining false loyalties to her work.

This individual and the second one, No. 28, who shows an

equally low social interest value, are among the highest in their religious interest values. Both have been in the work from the time when the strictly religious aspect of Y.W.C.A. work received more emphasis than it has in later years. There is interesting confirmation of both these values in the papers of the second individual. At the time she made application for membership in the American Association of Social Work her eligibility was questioned "because of her religious viewpoint and frequent opposition to methods and philosophy of social work in the community."

The third individual, No. 2, showing significantly low social interest value has been discussed. This result is in agreement with her low rating for extroversion and with her own statement of her personal problem and frustrations.

In all three cases then these results receive confirmation from other sources. In all three cases there is evidence that they are related to both success and satisfaction in the work.

Only two individuals show low religious values. These are both younger women who show significantly high social values. There is no evidence that this has been a handicap in either case.

Two individuals show a significantly high political interest value. In the case of No. 19 there is supporting evidence that she has a strong 'power' drive. She is said to have "a tendency to dominate others and place them in a subordinate position." "Her combative personality detracts." "Some feel she is a radical." She herself states "I seem to get satisfaction out of letting it be known that I have more than they of both experience and study." "My interest and zeal for changing the social order get in the way." "I can see what is wrong with any picture." Her social interest value is high. She is also strongly self-sufficient and socially dominant. However, the particular expression of these tendencies as reflected in the above statements confirms the high political interest value.

In the other case, No. 41, we find the following confirming statements. "A tendency to inflexibility which took the form of ownership of the job and an unwillingness to let other people

CHART - I

BERNREUTER PERSONALITY INVENTORY*

TRAIT DISTRIBUTIONS BY CODE NUMBERS

PERCENTILE	0	20	40	60	80	100
EMOTIONAL STABILITY	(2), (16), (19), (33)	5, (21), 29, 39	6, 9, 11, 24	1, 4, 7, 13, 14, (20), 23, 32, 40	3, 8, 10, 12, 15, (17), (18), 22, 25, (26), 27, (28), 30, 31, 34, 35, 36, 37, 38	
SELF SUFFICIENCY	(2), (16), 39	6, 7, 11, (28), (33), 34	(17), 24, 27	1, 3, 4, 8, 10, 12, 14, 15, (21), (26), 29, 30, 36, 40	5, 9, 13, (18), (19), (20), 22, 23, 25, 31, 32, 35, 37, 38	
EXTROVERSION	(2), (16), (19), (33)	5, (21), 29	6, 9, 39	1, 4, 11, 13, 14, (17), (20), 24, 25, 32, 40	3, 7, 8, 10, 12, 15, (18), 22, 23, (26), 27, (28), 30, 31, 34, 35, 36, 37, 38	
SOCIAL DOMINANCE	(2), 6, (16), (33)	(21), 39	5, 7, 9, 11, (28), 34	10, 13, 14, 23, 24, 29, 35, 40	1, 3, 4, 8, 12, 15, (17), (18), (19), (20), 22, 25, (26), 27, 30, 31, 32, 36, 37, 38	
PERCENTILE	0	20	40	60	80	100

* Numbers encircled represent cases discussed individually.

in on what she was doing," "constant desire to enlarge the scope of her department," "has often been difficult for her to be cooperative," "initiative" is mentioned in six of seven statements.[5]

The scope of this paper does not permit the discussion of the

[5] These were the only two individuals who were distinctly differentiated in the relative strength of their economic and political interest values.

other measures used. It is apparent that it is only after the array of information indicated above is available that the real work of counseling begins. The value of the counseling lies not in the objective results, but in the interpretation of these results, in the light of their relation to each other and to the complex, varied, and often conflicting evidence from other sources. It is the integration of this information, the reconciliation of real or apparent discrepancies or conflicts, which determines the value of counseling.

Crawford and Clement[6] have warned students to be sure of the professional training and the "interpretive caution" of those who presume to guide others through the use of objective measures. We approve this warning. But Allport[7] has pointed out that the traditional professional training predisposes toward concern with the "generalized human mind" and that this mythical mind is neither very useful nor satisfying to those who compare it with living individual models; also that dealing with isolated functions in the laboratory is a far cry from dealing with the complex personality in the stream of life.[8] Our experience verifies this. Allport further indicates that the *sine qua non* of psychological analysis is the possession of "original talent and happy instinct."[9] We believe we follow his thought although both terms seem to need further definition. We concur with him that the psychologist must make an ally of common sense.

We summarize thus: the objective measures discussed may render essential service to psychological counseling by individuals properly qualified professionally who make an ally of common sense and who possess the "original talent" and "happy instinct" of Allport and the "interpretive caution" of Crawford and Clement.

[6] Crawford and Clement, The Choice of an Occupation, Yale Univ. Press, 1932, p. 5.

[7] Allport, Personality, Henry Holt & Company, 1937, p. VII, p. 6.

[8] *Ibid.*, p. 6.

[9] *Ibid.*, p. 6.

EMPLOYEE ATTITUDES IN A DEPARTMENT STORE

ARTHUR KOLSTAD

Houser Associates

A STUDY of employee attitudes to be of greatest value to the management of an employing organization should provide (1) for a measure of over-all general job morale, (2) for the opportunity on the part of the employee to express his attitude on a large number of specific points concerning his job, working conditions, his relationship to his fellow employees, his relationship to his superiors, his understanding of managerial policies, and so on, and (3) for an evaluation of the specific attitudes and beliefs in terms of their correlation with general morale.

With these requirements in mind there was developed a questionnaire which consists of (1) a battery of questions designed to measure general over-all job morale and (2) a large number of specific questions to cover the desired fields.

Morale was defined in terms of department store situations. Based on previous similar studies in a number of department stores, a series of questions was selected to cover such a definition. The simplest way of presenting this definition is to list the attitudes and beliefs selected to describe high morale.

The employee with high morale is one who

Feels very sure of holding his job as long as he does good work;

Has been made to feel in every way that he is really a part of the organization;

Feels that the management does a great deal more than could be expected to have good working relationships between him and the people with whom he works;

Feels that the management of this store is more interested in the welfare of people in jobs such as his than are any of the other department stores in the city;

Has never been dissatisfied with his job, or if he has, such dissatisfaction was hardly ever the store's fault;

Believes that this department store treats its employees better than any of the other department stores in the city;

Feels that the management is always fair with the employees in jobs such as his;

Feels that his immediate superiors are always fair in their treatment of him;

Can always find out whether his work is improving or not;

Knows of no other department store in the city in which he would rather work if he could get the same job at the same salary in one of them.

Ten multiple-choice questions were used to cover these topics. Each question has five graded responses: for example:

"How much does the management do to have good working relationships between you and the people with whom you work? (Check ONLY ONE of the five answers)

( ) As LITTLE as possible.
( ) Much LESS than one could expect.
( ) About as much as one could expect.
( ) A little MORE than one could expect.
( ) A GREAT DEAL MORE than one could expect."

Each response in these ten questions was weighted resulting in a possible range of scores from plus 48 to minus 48.

Three forms of the questionnaire were used: (1) for the executive group, (2) for the selling employees and (3) for the non-selling or functional employees. Only the results from using the two forms for the rank-and-file employees are reported here. The selling form differs from the non-selling form chiefly in length by the addition of questions concerning the salesperson's individual department and concerning selling situations. The majority of questions are of the multiple-choice form with a small number of "yes-no" questions.

In this store (an Eastern department store), 740 non-selling employees and 660 selling employees filled out the questionnaire under group test conditions. The employees were assem-

bled in groups in the auditorium, the purpose of the questionnaire was explained with a request for frankness in answering the questions since no signatures were required and there would be no means of identifying any paper.

The selling employees included representatives from all departments. The non-selling group included such departments or sections as accounting, credit office work, stenographers, file clerks, mail clerks, cashiers, examiners, packers, delivery, inventory, stock marking, stock receiving, reserve stock work, stock control, advertising, display, elevator operators, telephone operators; practically all non-selling employees except charwomen, truck drivers, warehouse men and workers in alteration and repair departments were included among those who filled out the questionnaire.

In the development of the weights to be assigned to the responses to the morale questions, intercorrelations of the ten items were calculated. To serve as a check, the 45 zero-order correlation coefficients were calculated for each of the two above groups.

The majority of items used in the morale battery have low correlations with the other items. The intercorrelations for the Selling Group range from .093 ± .026 to .644 ± .015; for the Non-Selling Group from .059 ± .025 to .646 ± .014. The distribution of the r's is shown in the following table:

Number of r's of Various Magnitudes

	.00–	.10–	.20–	.30–	.40–	.50–	.60–	MEAN	MEDIAN
Selling	1	8	4	21	8	2	1	.328	.354
Non-Selling	1	6	10	15	9	2	2	.340	.349

Comparing the pairs of coefficients for the two groups shows that sixteen r's differ by less than 1 P.E.; sixteen additional r's (a total of thirty-two) differ by less than .05. Three differ by .10 or more; the largest difference found was .14 (difference between an r of .31 and an r of .17).

Each item was also correlated with total score. Eight of the ten correlation coefficients are more than .60. The aver-

age of these correlation coefficients is .615; the median is .626.

Since some of the questions used are of the "yes-no" form, the responses were related to the morale score by finding the ratio of the difference between the mean scores to the standard deviation of the difference, in each case dividing the responses to a multiple-choice question at a point in the graded steps which would give a positive statement of attitude.

Two questions will illustrate the manner in which the responses to the multiple-choice questions were divided.

A. "In your opinion, how much care is taken to give the people in the store the help they need in their work so as to get the kind of results the management expects?

( ) There is no attempt at all to give you the help you need.
( ) Once in a while they give you the help you need.
( ) About half the time they give you the help you need.
( ) They usually give you the help you need.
( ) They always give you the help you need."

These responses were divided between the third and fourth step, giving the positive statement, "The people in the store are *usually* given the help they need in their work so as to get the kind of results the management expects." Subscribers to the first three steps deny that help is "usually given."

B. "Do you get contradictory or conflicting orders from people above you?

( ) Always.
( ) Usually.
( ) About half the time.
( ) Sometimes.
( ) Never."

Dividing these responses between the fourth step and the fifth step gives the statement, "I never get contradictory or conflicting orders from people above me." Persons who check the first four steps state that they *do* get contradictory or conflicting orders.

Responses to the two groups were analyzed separately, since

the management and the managerial policies differ for the two divisions of employees. The morale scores for the non-selling employees are significantly lower than the scores for the selling employees.

The mean morale scores for the two divisions are:

Selling Employees	22.54 ± 1.41	$(N = 660)$
Non-selling Employees	10.53 ± 0.45	$(N = 740)$

In the tables which follow the items have been segregated according to major topics for easier comparison of items that are related.

Key to columns in the tables which follow:

T. Mean morale score of the employees who endorse statement.

F. Mean morale score of the employees who endorse a statement contradictory to the one listed.

R. Difference between the means divided by the standard deviation of the difference (Formula used $\sigma_d = \sqrt{\sigma_{M_1}^2 + \sigma_{M_2}^2}$)

Section A. Phases That Influence Directly the Results Achieved by the Employees on the Job

STATEMENT	SELLING			NON-SELLING		
	T	F	R	T	F	R
I am *usually* given the help I need so as to get the kind of results the management expects	26.5	7.6	13.0	20.0	−1.3	19.0
I am given *all* the information I could wish for about the important plans and results which concern my work	30.8	17.6	11.7	20.5	2.1	13.1
I have been given to understand *completely* the methods which my superiors wish me to follow	27.6	14.1	11.3	16.8	2.8	11.2
My duties have been defined *completely*	26.1	12.7	9.9	15.8	1.9	10.7
I have been given to understand *completely* the results which are expected of me	26.7	14.9	9.6	15.9	2.4	12.0
There is *not* so much red tape in the store that I cannot do my best work	25.8	11.9	9.1	14.2	−0.4	9.7
My superior never hampers my work	26.5	15.7	8.5	16.8	1.4	12.3
My work is fairly regular in amount	23.2	20.4	1.9	12.8	5.9	4.8

Section B. Promotion and Pay

STATEMENT	SELLING			NON-SELLING		
	T	F	R	T	F	R
When there is a better job vacant, the best-qualified person *always or almost always* gets promoted to it	35.2	18.4	15.9	28.0	5.9	16.8
Pay increases usually come when deserved	29.5	14.9	11.8	21.6	4.8	11.7
I feel that I am growing in my present job	28.0	17.6	8.7	19.0	4.0	11.5
The pay for my job is as high or higher than the pay in other large department stores in the city for the same sort of work	23.4	9.1	8.1	12.8	2.6	6.4
There are *no* other jobs in the store which I believe I could now handle and which I would rather have	27.4	19.0	6.9	18.8	5.3	10.1
There are *no* other jobs in the store I could be trained in a short time to do and which I would rather have	27.7	19.6	6.2	19.3	6.0	9.1
There are no other jobs in the store I would rather have at the same pay I am now receiving	26.1	18.9	5.9	17.0	4.2	9.7
The pay for my job is as high or higher than the pay for other jobs in this store that are equally important	23.0	16.0	4.5	17.5	3.9	9.0
I have a clear idea as to the definite lines of promotion which are ahead of me	24.4	21.8	1.9	17.4	8.3	5.7

Section C. Relationships to Superiors

STATEMENT	SELLING			NON-SELLING		
	T	F	R	T	F	R
Employees in jobs such as mine are encouraged *in every way* to offer new ideas and suggestions and to try out better ways of doings things	32.4	17.1	14.4	27.9	4.7	17.5
The people above me understand *all* the difficulties of my job	36.8	19.9	13.4	27.2	7.8	11.2
If I have a grievance I am reasonably sure of being able to get a fair hearing and a square deal	26.5	7.8	12.6	16.2	−5.3	16.9
When, or if, real problems arise I am made to feel *completely* free to ask advice	29.9	16.0	12.5	20.6	4.0	13.3
When new plans are being made, I am *usually* invited to offer suggestions	30.4	17.1	11.9	23.1	6.1	12.0
I am given reasons for *most* of the changes that are ordered in my work	29.4	15.9	11.8	19.7	3.7	12.6
I *never* get contradictory or conflicting orders from the people above me	29.0	16.6	10.9	20.2	4.6	12.2
I have *never* been so angry at the store or at a superior that I wanted to quit	30.0	18.5	9.7	23.7	4.9	14.6
I am *not* responsible to too many different superiors	25.2	13.9	7.8	16.4	2.6	10.2
Usually I make the decisions in my work	28.4	20.0	6.6	16.3	8.3	5.0

Section D. Store Pride (Rating of Store)

STATEMENT	SELLING			NON-SELLING		
	T	F	R	T	F	R
Compared with all the other department stores in this city This store is the best of all for value of merchandise	33.3	18.7	12.7	24.6	7.0	10.6
This store is the best of all for smart, stylish, up-to-date merchandise	31.3	18.7	10.1	20.9	6.2	9.7
This store is the best of all for assortment of merchandise	31.6	18.9	10.0	24.0	6.9	11.1
This store is the best of all for quality of merchandise	29.9	18.4	9.5	19.4	6.9	8.4
This store is most liberal to the customer in making exchanges and adjustments	25.1	16.9	6.4	15.2	7.0	5.8
The service given by salespeople in this store is best of all	27.0	19.2	6.2	21.0	7.5	7.9

Difference between Two Groups in Significance of Items

The correlation between the ratios (difference between means divided by standard deviation of difference) for the two divisions of employees is $0.83 \pm .037$ for the thirty-three items reported here.

The largest differences in rank order are for the four following items: "Store best for value of merchandise" ranks *fifth* for the selling group and nineteenth for the non-selling group. "No hampering of work by superior" ranks twenty-second for the selling group and ninth for the non-selling group.

"Understanding of difficulties of job by superiors" ranks third for the selling group and fifteenth for the non-selling group.

"Anger at store superior" ranks seventeenth for the selling group and fifth for the non-selling group.

The largest gross differences in ratios are for the four following items:

1. "Help needed to get results expected." (Ranks: fourth and first.)
2. "Anger at store or superior." (Ranks: seventeenth and fifth).
3. "Pay compared with pay for other jobs in store." (Ranks: thirty-first and twenty-sixth).
4. "Fair hearing for grievances." (Ranks: sixth and third).

Based upon the responses of all of the employees in this store, the ten items most closely related to job morale of those included in the study are the following (figures in parentheses are ratios):

1. Promotion of best qualified persons* (34.1).
2. Help needed to get results expected (25.6).
3. Encouragement to offer new ideas and suggestions (23.5).

* For complete statement from which this phrase is abstracted see tables above.

4. Fair hearing and square deal for grievances (20.7).
5. Pay increases when deserved (18.7).
6. Invitation to offer suggestions when plans are being made (18.6).
7. Freedom to seek advice when problems arise (18.3).
8. Reasons given for changes ordered in work (17.7).
9. Information about plans and results (17.6).
10. No contradictory or conflicting orders (17.0).

Sex, Marital Status, and Length of Service Differences in Morale Scores

Employees filling out the Opinion Questionnaire were asked to check (1) sex, (2) marital status, and (3) length of service (three groups only to avoid possibility of identification when coupled with department in which they work). The mean morale scores for these groups are presented in the accompanying table for the two divisions separately.

	MEAN MORALE SCORES	
	Selling	Non-Selling
All employees	22.5 ± .41	10.5 ± .45
Men	19.6 ± .85	11.5 ± .77
Women	23.6 ± .50	9.2 ± .58
Married men	19.0 ± 1.18	15.4 ± 1.52
Single men	20.1 ± 1.16	9.7 ± .88
Married women	24.2 ± 1.16	10.7 ± 1.41
Single women	23.3 ± .56	9.0 ± .64
Length of service in this store:		
Less than one year	22.5 ± .75	12.3 ± .81
One to five years	20.5 ± .71	6.6 ± .72
Over five years	24.6 ± .69	12.6 ± .76

SUMMARY

1. Non-selling employees in this department store were found to have significantly lower morale (as defined here) than selling employees.
2. The attitudes or beliefs (of those studied here) most

closely related to morale among the selling employees are those which center around the following topics:

a. Promotion of best-qualified persons.
b. Encouragement to offer new ideas and suggestions.
c. Understanding of difficulties of jobs by superiors.
d. Being given needed help to get results expected.

3. The attitudes or beliefs most closely related to morale among the non-selling employees are those which center around the topics:

a. Being given needed help to get results expected.
b. Encouragement to offer new ideas and suggestions.
c. Fair hearing and square deal on grievances.
d. Promotion of best-qualified persons.

4. No significant differences (difference at least three times the standard deviation of the difference) in morale scores were found between (a) men and women, (b) married men and single men, (c) married women and single women.

5. Among non-selling employees, those who had worked in the store one to five years have a significantly lower mean morale score than those who had worked there less than one year or more than five years.

Among the selling employees also, those who had worked in the store from one to five years have a lower mean morale score than those who had worked there a longer or a shorter time; these differences, however, are not significant.

JUDGING EXPRESSIVE MOVEMENT: I. JUDGMENTS OF SEX AND DOMINANCE-FEELING FROM HANDWRITING SAMPLES OF DOMINANT AND NON-DOMINANT MEN AND WOMEN[1]

PHILIP EISENBERG
Columbia University

THE PROBLEM

At least ten studies have been undertaken to investigate the problem of how well judges can recognize the sex of the writers from samples of handwriting. Vernon[2] summarizes the results of these experiments in terms of the per cent correct, and in terms of a coefficient of contingency derived from a formula of his own devising. Since there are only two alternatives, male or female, a 50 per cent correct response is what is to be expected as the most probable figure by chance. The actual percentages of correct judgments range from 57.3 to 77.4 per cent, the highest figure being obtained by graphologists, and the median being 65.65 per cent. The derived coefficients of contingency range from .15 to .48, with a median of .30. These results, indicating a better than chance judgment of sex from handwriting, may be explained on several bases: (1) the past experience of the judges, and (2) actual sex differences in this expressive movement both because of differences in the physical structure of the hand and because of different cultural emphases for the two sexes.

However, the experimenters quoted by Vernon have neglected to take into account a fact that has been long recognized

[1] We wish to acknowledge the invaluable criticism of the manuscript by Dr. Max Hertzman and Miss Rosalind Gould.

[2] Vernon, P. E. The Matching Method Applied to Investigations of Personality. Psychol. Bull., 1936, 33, 149–177.

by graphologists, namely, that the psychological aspects of sex rather than the physiological are revealed in handwriting. Most graphologists will refuse to undertake a handwriting analysis unless they are told the sex of the individual beforehand because, through previous experience, they know they will make many errors. The reason for such errors becomes clear, when we realize that although our culture stresses differing rôles for men and women these rôles are not always acceptable or desirable for a given individual for a variety of reasons. For example, that a good proportion of women do not accept the traditional feminine rôle is demonstrated by feminist movements and by the increasing number of women doing "man's" work. These statements are given further elaboration and support by Mead[3] in her analysis of three primitive cultures.

For this reason, we considered the hypothesis that judges would tend to judge as men's writing, the handwriting of dominant individuals, male or female, and as women's writing, the handwriting of non-dominant individuals, male or female.

PROCEDURE

Sixty handwriting samples were obtained from 30 men and 30 women, Columbia and Barnard college students, under standard conditions. On the basis of the Maslow "Social Personality Inventory," a rating scale of dominance-feeling (both of these being administered twice) and an interview, 15 men and 15 women at each extreme of dominance-feeling were selected. Thus our handwriting samples were written by 15 extremely dominant and 15 extremely non-dominant men, 15 extremely dominant and 15 extremely non-dominant women.[4]

[3] Mead, M. Sex and Temperament. New York: Morrow, 1935. Pp. xxii + 335.

[4] For a description of the method of obtaining the handwriting samples and of the extreme groups, see Eisenberg, P. Expressive Movements Related to Feeling of Dominance. Arch. Psychol., 1937, No. 211. Pp. 73.

These 60 samples of handwriting were given to ten judges, graduate students of psychology at Columbia University, to judge for sex. They were told that there were 30 men's handwritings and 30 women's, but they were not aware of the fact that within each sex group there was a separation into extreme dominant and non-dominant groups. After making these judgments, they were required to state what they considered to be the characteristics of a masculine and of a feminine handwriting. Then the 30 men's and the 30 women's handwriting samples were judged separately for feeling of dominance, the men's group always being judged first. The task of the judges consisted in deciding whether the sample was written by an extremely dominant or by an extremely non-dominant individual. The following description of dominance-feeling was given to the judges:

"Feeling of dominance is defined as general self-confidence, and high level of self-evaluation. It includes a forcefulness of character, 'strong' personality, a feeling of being 'on top,' a feeling of mastery over others, a feeling of general capability. It may assume several forms in different people: despotism, aggressiveness, helpful leadership, guidance, or just feeling dominant with no active expression. . . . Low dominance-feeling, in general, consists of the reverse or absence of these feelings. It includes feelings of general inferiority, lack of self-confidence, uncertainty, feeling dominated by others, timidity and shyness, often a willingness to be self-effacing, and self-consciousness."[5]

RESULTS

It was found that the per cent of correct judgments of sex for the entire group of judges was 71.70 per cent, which compares favorably with the median of 65.65 per cent of previous experiments. In terms of a coefficient of contingency, using Vernon's method, this was $.40 \pm .13$, the median of previous experiments being .30. The fact that the percentage of correct

[5] For an elaboration of the concept of dominance-feeling, see Maslow, A. H. Dominance-Feeling, Behavior and Status. Psychol. Rev., 1937, 44, 404–429.

judgments is slightly higher than previous findings cannot be attributed to the particular sampling of our group since none of these graduate psychology students had ever studied handwriting seriously. Another possible explanation for this difference lies in the composition of the group whose handwriting was judged, that is, the group was a bimodal one based on the dominance-feeling tests.

So far we have confirmed the previous findings that individuals can judge sex from handwriting a little better than chance. But when we make an analysis of the errors in judgment of sex in terms of dominance-feeling, we discover a very clear relationship. More errors are made in judging the sex of non-dominant men and dominant women than dominant men and non-dominant women. The following is the actual average number of errors made out of 15 possible judgments within each group: dominant men 3.7, non-dominant men 4.7, dominant women 5.4, non-dominant women 3.2. The reliability of the difference for number of errors made between dominant and non-dominant men was 1.55, and for the women 2.99. These critical ratios are rather high considering the small number of judges, and there is little reason to believe that the same relationships would not hold with a larger group of judges.

This relationship is surprisingly clear when we examine each individual's judgments. Eight out of 10 judges definitely revealed the group tendency. The two judges who showed a reversal of the group tendency, did so because they were using as characteristics of male and female writing, the reverse of the characteristics described by the rest of the group. Another interesting support of our hypothesis is that the description of dominance-non-dominance characteristics of handwriting given by the judges proved to be about the same as that of male-female characteristics. Some individuals explicitly stated that they used the same criteria in judging both sex and dominance-feeling.

It appears then, that if individuals in making such judg-

ments of sex are influenced by the dominance-feeling revealed in the handwriting, they should be able to differentiate between the handwritings of dominant and non-dominant individuals. However these judgments of dominance-feeling proved to be little better than chance. For the judgment of dominance in men, the average per cent correct judgments was 50.67 per cent, or a C of $.015 \pm .18$; and for the women 64.00 per cent, or a C of $.27 \pm .15$.

These data seem to contradict our first findings. But if we look a little more closely into the matter, we see that the judging of sex was a somewhat different situation for the judges than the judging of dominance-feeling. Maleness-femaleness was a very concrete concept for them, whereas dominance-non-dominance was something new and comparatively vague. Thus, although the judges thought they were estimating dominance on the same basis as sex, this was only partially true.

That the judges were not consistently using the same criteria is indicated by the fact that of the 47 incorrect judgments of non-dominant men as women, only 23 (48.94 per cent) of these were correctly identified as non-dominant. Similarly of 54 incorrect judgments of dominant women as men, 40 (74.07 per cent) were correctly identified as dominant. From these figures it appears that in the case of the women, more than in the case of the men, the same criteria used for sex judgment was more consistently applied to judging for dominance-feeling. The data showing that women are judged 13.33 per cent more accurately for dominance-feeling may be due simply to the fact that women's handwritings are "easier" to judge for such a characteristic. In other words, this difference in basis of judgment of male and female dominance-feeling may be a result of the fact that there is a wider, hence more easily perceived, difference between the expressive handwriting movements of dominant and non-dominant women, than there is between dominant and non-dominant men. However, although this greater disparateness between expressive handwriting movements of dominant and non-dominant women, which

seems the most likely explanation of the greater ease of differentiating the two extremes, does aid in the judgments of dominance-feeling of women, it also acts as a source of confusion when judging for sex. Thus we find a larger difference in the number of errors made in judging sex between the dominant and non-dominant women than between the dominant and non-dominant men.

SUMMARY AND CONCLUSIONS

Samples of handwriting of 30 men and 30 women, 15 of each sex group representing the extremes of dominance-feeling, were presented to 10 graduate psychology students. Their first task was to judge sex as revealed to them by each handwriting specimen. They were later given the men's and the women's handwriting samples separately and asked to judge them for dominance-feeling. This procedure was adopted in an effort to explain the errors made in identifying sex from handwriting samples.

It was found that:

1. Sex was judged 71.70 per cent correct by the entire group, comparing favorably with previous studies.

2. More errors were made in the judgment of sex for the non-dominant men and dominant women than for the dominant men and non-dominant women. This supports the hypothesis that judgments are made rather on the basis of the psychological make-up of the writer than by the physiological make-up.

3. The same trends are shown in the analysis of the judgments of individual judges, and by the fact that the characteristics of male-female writing used by the judges were to a large extent the same as those utilized in estimations of dominant-non-dominant writing.

4. Dominance-feeling was judged 50.65 per cent correct for the men, and 64.00 per cent for women, very little better than chance. But this does not invalidate our first findings, since it is demonstrated that in judging dominance-feeling, the

judges were not using exactly the same criteria as in their judgment of sex, the concept of dominance-feeling being a much vaguer one for them than "maleness-femaleness."

5. These data indicate very clearly that the matching method cannot be used as an instrument to study the relationships between various aspects of personality, because of the complicating factors involved in the process of judging itself, but it can be used in studying the process of judging. A further study serves as additional corroboration for this view.[6]

[6] Einsenberg, P. and Reichline, P. B. Judging Expressive Movement: II. Judgments of Dominance-Feeling from Motion Pictures of Gait. Forthcoming article in Journal of Social Psychology.

PERSONALITY TRAITS AND ATTITUDES OF JEWISH AND NON-JEWISH STUDENTS*

MAY SUKOV AND E. G. WILLIAMSON

University Testing Bureau,
University of Minnesota

A POPULARLY entertained assumption is that Jewish persons, innately or otherwise, differ in personality and attitudes from non-Jewish persons. Expressions such as these are quite common: "The Gentile has a more cheerful outlook on life than has the Jew"; "Most Jews are Communists"; and "The Gentile is heathen and more stable than is the Jew." In only a few instances has this assumption been submitted to statistical analysis. Sward and Friedman[1] compared the self-ratings of 625 adult Jews with those of more than 625 non-Jews on the Bernreuter Personality Inventory (using the neurotic scale only) and Heidbreder's questionnaire for introversion and inferiority attitudes. The groups were paired in four variables: age, general aptitude, residence, and economic class (by Goodenough's scale). Approximately sixty per cent of the Jewish subjects had neurotic scores which exceeded the non-Jewish mean in the direction of instability; there was a similar overlapping held for the inferiority complex. The authors question the validity of introspection and conclude that the slight difference in mean temperament score is logically related to the causative factors of heredity, nativity, and conditioning.

In another study, Sward[2] used the method of item analysis

* Grateful acknowledgment is made for the assistance furnished by the Minnesota W. P. A. Project No. 6094–4214.

[1] Sward, Keith and Friedman, Meyer B., "Jewish Temperament," JOURNAL OF APPLIED PSYCHOLOGY, Vol. 19, No. 1, February, 1935, pp. 70–84.

[2] Sward, Keith, "Patterns of Jewish Temperament," JOURNAL OF APPLIED PSYCHOLOGY, Vol. 19, No. 4, August, 1935, pp. 410–423.

rather than the method of mean differences in total score, since he found no significant differences with means by total scores. Using the Bernreuter Personality Inventory, he found four distinguishing patterns characterizing the Jewish students' introspections: gregariousness, submissiveness, drive and over-reaction, and various anxiety states and symptoms of mood change. Again, he attributes this pattern to social conditioning.

Garrett[3] reports a study of personality traits of 296 college freshmen including 82 students of Jewish nationality. The test used was the Laird's Personality Inventory B2. As in the other studies, there were no significant differences among the different groups on the Personal Inventory. The group of Jewish students were somewhat less stable emotionally but the differences were not reliable.

The purpose of the present study was to find out if there are any significant differences in certain personality traits and attitudes between Jewish and non-Jewish freshmen students in the Arts College and the General College at the University of Minnesota. Students who apply for admission to the University fill out a six page form; one question on that form calls for a statement of religious preference. In classifying students by means of this admissions form, students who gave as their religious preference Jewish or Hebrew, were classified as Jewish students. Then the scores on personality tests were collected from the Testing Bureau's record files.

In September, 1935, 1,324 freshmen were given the Minnesota Scale for the Survey of Opinions. This is a short battery of scales to measure phases of personality and social attitudes which are of fundamental significance for personal adjustment. The reliability coefficients for the scales for a group of 500 of each sex as corrected by the Spearman-Brown formula[4] are as follows:

[3] Garrett, H. E., "Jews and Others: Some Group Differences in Personality, Intelligence, and College Achievement," PERSONNEL JOURNAL, Vol. 7, No. 5, February, 1929, pp. 341–348.

[4] Rundquist, E. A. and Sletto, R. F., *Personality in the Depression:* A

SCALE	500 MALES	500 FEMALES
Morale	.79	.81
Inferiority	.78	.82
Family	.83	.88
Law	.84	.82
Economic Conservatism	.85	.82
Education	.82	.83

The higher score indicates the more unfavorable adjustment or the more extreme attitude. The scales included are as follows:

Morale—A measure of the degree to which the individual feels competent to cope with the future and to achieve his desired goals. Scores reflect feelings of insecurity and discouragement.

Inferiority Feelings—A measure of the degree to which the individual feels at ease or possesses feelings of inferiority and inadequacy in his social contacts.

Family—A measure of family intimacy or discord, particularly in parent-child relationships.

Law—A measure of attitudes toward law and legal institutions.

Economic Conservatism—A measure of attitudes concerning the prevailing economic system.

Education—A measure of the estimate an individual places upon the value of education as a social institution and as a means for personal advancement.

General Adjustment—A measure of generalized adjustment or maladjustment. Persons who score unfavorably on this scale usually score unfavorably on four or more of the less general scales.

Contained in the group of college freshmen were 637 non-Jewish and 94 Jewish men; 524 non-Jewish and 69 Jewish women. Twelve and three-tenths per cent of the group were classified as Jewish.[5]

A smaller group of students consisting of 366 non-Jewish

Study in Attitude Measurement, University of Minnesota Press, Minneapolis, Minnesota, 1936.

[5] This percentage is larger than the proportionate percentage of all Jewish students registered at the University. In 1935, out of about 5,760 students who filled out religious census cards only six per cent were Jewish students.

and 49 Jewish students also filled out the Bell Adjustment Inventory. This inventory provides four separate measures of personal and social adjustment as follows: Home Adjustment, Health Adjustment, Social Adjustment, Emotional Adjustment. The odd-even coefficients of reliability for the Adjustment Inventory as corrected by the Spearman-Brown prophecy formula are as follows: Home Adjustment, .89; Health Adjustment, .80; Social Adjustment, .89; Emotional Adjustment, .85; Total Score, .93. Test-retest data over a period of nine months yield the following coefficients of reliability:[6]

	MEN (319 College Students)	WOMEN (213 College Students)
Home	.817	.824
Health	.702	.792
Social	.815	.768
Emotional	.769	.692

Individuals with higher scores tend to be unsatisfactorily adjusted to their home surroundings, to be more submissive and retiring, to have poor health, and to be unstable emotionally.

Table I presents the mean scores, standard deviations, and critical ratios for both sexes on the Rundquist-Sletto Test. Similar data are presented in Table II for the Bell Inventory.

SUMMARY AND CONCLUSIONS

1. For both sexes, there are reliable differences between the mean scores made by Jewish and non-Jewish students on the Morale, Law, Education (women only) and General Adjustment scales of the Rundquist-Sletto test. This suggests that the Jewish student has a more marked tendency toward maladjustment than has the non-Jewish student, *on the average.*

2. On other sections of the Survey of Opinions test, the

[6] Darley, J. G., "Changes in measured attitudes and adjustments." THE JOURNAL OF SOCIAL PSYCHOLOGY, 1938, Vol. 9, pp. 189–199.

TABLE I

Comparison of Test Scores on the Rundquist-Sletto Test

	MEN					WOMEN				
	94 Jews		637 Non-Jews		Critical Ratio	69 Jews		524 Non-Jews		Critical Ratio
	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.	
Morale	57.38	9.77	54.19	8.00	3.09	57.50	8.37	54.12	8.55	3.15
Inferiority	65.14	8.86	63.77	9.75	1.38	66.15	7.85	65.25	9.62	0.87
Family	54.96	9.21	53.84	9.48	1.10	52.72	8.40	53.92	8.08	1.13
Law	57.76	8.69	55.59	8.50	2.27	57.15	9.30	54.80	8.16	2.00
Economic Cons.	63.79	11.85	62.45	11.60	1.03	66.15	10.75	63.74	8.93	1.78
Education	47.17	7.90	46.10	7.62	1.23	48.24	9.30	45.35	8.05	2.46
General Adj.	40.02	7.40	37.96	6.56	2.55	40.76	7.03	37.29	6.34	3.90

TABLE II

Comparison of Test Scores on the Bell Inventory

	MEN					WOMEN				
	20 Jews		233 Non-Jews		Critical Ratio	29 Jews		133 Non-Jews		Critical Ratio
	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.	
Home	6.80	4.15	5.74	4.96	1.08	4.45	4.01	5.87	5.03	1.65
Health	7.30	5.60	5.71	3.66	1.25	6.93	4.20	6.17	4.47	0.87
Social	11.60	5.66	12.10	7.05	0.37	11.48	6.20	12.57	6.60	0.85
Emotional	10.40	6.90	8.31	5.61	1.32	10.51	6.12	9.86	5.47	0.53
Total	35.85	17.61	31.58	15.53	1.05	32.74	15.47	33.95	14.56	0.38

Jewish men make higher (unfavorable) scores than do the non-Jewish men. The differences, however, are not statistically significant.

3. For the women, the same trend holds except on the Family scale. On this section, the non-Jewish female student receives the higher score. But the difference is not statistically significant.

4. On the Adjustment Inventory, there are no significant differences between the two groups of students.

5. On the whole, the differences within each group are greater than the differences between the two groups.

It is possible that there may be some personality traits and attitudes not measured by these two tests which would reveal significant group differences between the Jewish and non-Jewish groups. However, on the basis of the data available for these groups, it would seem that the popular notion that all Jewish students differ in personality traits from non-Jewish students is a fallacious assumption. The significant *group* differences in the Morale, Law, Education (women only) and General Adjustment scales do not, of course, indicate significant differences between all individuals in the groups.

PREDICTION OF ACHIEVEMENT IN ELEMENTARY ALGEBRA

MAY V. SEAGOE

University of California at Los Angeles

EVER since high schools began admitting an unselected group of pupils, their highly selective courses in mathematics and languages have been sources of a high proportion of failure. This is particularly true in elementary algebra because of its position as the first in the usual series[1] of college requirements. Prediction of probable success is therefore of major importance.

Numerous studies have been made, particularly of the relative merits of various algebra prognosis tests and certain general intelligence tests. Lee claims that "Most studies, where intelligence tests are correlated with success in various subjects, show that the correlation between intelligence and success in mathematics is comparatively low."[2] Torgerson and Aamodt, on the other hand, find the Otis general intelligence test equal to the Lee and the Orleans prognosis tests in validity, and sharper in its discrimination of a critical score below which failure seems inevitable.[3] Grover similarly finds that the Orleans test predicts achievement very well, though the validity of the prognosis is increased if the Orleans result is combined with that of an intelligence test.[4]

[1] A later article will deal with language data for the same population and with similar techniques.

[2] Lee, J. Murray. *Measurement in Secondary Schools*, p. 93. New York, Appleton-Century, 1932.

[3] Torgerson, T. L. and Aamodt, G. P., "The validity of certain prognostic tests in predicting algebraic ability." *Journal of Experimental Education*, 1933, *1*, 277–279.

[4] Grover, C. C. "Results of an experiment in predicting success in first year algebra in two Oakland junior high schools." *Journal of Educational Psychology*, 1932, *32*, 309–314.

PROBLEM

The data at hand promised to shed some additional light on the subject for several reasons. In the first place, the comparative data were somewhat more extensive; tests which would theoretically be only remotely related to the problem, such as a prognosis test in foreign language and a mechanical aptitude test, were available for comparison with the more logically related tests. In the second place, the method of administering tests more adequately represented the usual junior high school procedure than most short-term studies can do: guidance for ninth grade subjects was based largely on test data gathered at entrance to the seventh grade. In the third place, because of the more extensive data intercorrelations between possible predictive factors could be worked out. In the fourth place, the study is not one of failure *versus* success because, with the operation of a rather intensive guidance program, there were no failures. It was rather a study of the differential power of certain tests in discriminating probable degree of success for those electing algebra and the validity of the advice on which non-election was based.

Some of the specific questions the study was designed to answer include: (1) Is the Orleans Prognosis Test in Algebra superior to such tests as the Terman, Otis, and Kuhlmann-Anderson in predicting degree of success in algebra? (2) Is the Orleans superior to an arithmetic achievement test? (3) Is the assumption of certain counselors that the Kuhlmann-Anderson Intelligence Test, because of the nature of its content, predicts success in algebra better than the Terman or the Otis justified? (4) Is it possible to establish fairly definite critical scores differentiating potential failure from satisfactory and satisfactory from recommended grades?

SUBJECTS, MATERIALS, AND PROCEDURE

The subjects were 121 students, 64 boys and 57 girls, whose records were being followed in connection with the Carnegie

Guidance Experiment in Pasadena, California.[5] In this project all students entering 7-1 in September, 1934, were designated as the experimental group, a group which was followed for three years with a more than normally intensive guidance service.

The tests used in this study include the Terman Group Test of Mental Ability given in May, 1934, just prior to junior high school entrance, the Kuhlmann-Anderson Intelligence Test given in May, 1936, and the remainder drawn from the general testing program carried on during the fall of 1934. Tests from the general program referred to in this article include the Otis Intermediate Examination, the new Stanford Achievement Test (sections on reading, physiology, and arithmetic), the Luria-Orleans Modern Languages Prognosis Test, the Stenquist Mechanical Aptitude Test, and the Orleans Algebra Prognosis Test. The reading and language tests were included to determine the relationship of algebra to foreign language prediction, and the physiology and mechanical aptitude tests were included to determine whether practical and scientific aptitude and achievement were more closely related to mathematical ability than were verbal factors. The latter question is of importance to those who would integrate secondary mathematics and science.

Following the administration of each test the results were reported to the individual concerned and their significance for his educational and vocational plans was discussed. In case the individual planned to take algebra or was uncertain whether he should elect it, he was advised to enroll in the 8-1 arithmetic class which gave some time to background for algebra and geometry. In 8-2 the student made his decision concerning algebra on the basis of his knowledge of his own abilities, based on both experience and on standardized test data, and on his educational plans. The choices were reviewed by the counselor on the same bases, and individuals whose choices

[5] The Experiment was directed by Dean Grayson N. Kefauver of the School of Education at Stanford University.

seemed ill-advised were interviewed. In a few cases algebra was dropped early the succeeding semester. The counselor's advice was based on the rule-of-thumb assumption that the result of the intelligence tests should indicate an IQ of 110 or higher, that the record in arithmetic should be at least average, and that the record on the Orleans Algebra should place the individual in the upper half of his class if he is to succeed in algebra. The assumptions seemed justified in a school where approximately forty per cent of the pupils attend college. Exceptions were made where the pupil's home background, reputation as a student, apparent special aptitude in the field, or fixed vocational or educational objectives seemed to demand.

Teachers' marks at the completion of the first semester of algebra constituted the criterion of success. They were stated only as "Recommended" or "Satisfactory" for the student's information in planning for tenth grade work since a personal letter took the place of the grade report and the only official record was one of granting or refusing credit.

RESULTS

In the discussion of results it will be noted that derived rather than primary scores have been used because of their availability in intelligence and achievement tests. The result would theoretically be to underestimate the relationship and the degree of discrimination shown rather than to overestimate. The use of the intelligence quotient rather than the mental age can be justified because of the non-failure program in operation in Pasadena, resulting in little differentiation in chronological age among the groups as shown in Table II. With chronological age relatively constant, the intelligence quotient is directly proportional to the mental age. Where the usual promotional policy is in effect, however, predictions from intelligence tests would be best made in terms of mental age. For example, a sixteen year old with an intelligence quotient of 100 would have ability equal to a fourteen year old with an intelligence quotient of 114.

Table I presents the product-moment correlations between tests used and each of the three intelligence tests to compare

TABLE I

Intercorrelations between Tests

TEST	TERMAN	OTIS	KUHLMANN-ANDERSON
Terman IQ	.....	.76 ± .03	.77 ± .03
Otis IQ	.76 ± .03	.....	.78 ± .03
Kuhlmann-Anderson IQ	.77 ± .03	.78 ± .03	.....
Stanford Reading G.P.	.74 ± .03	.73 ± .03	.67 ± .03
Luria-Orleans Language Score	.73 ± .03	.71 ± .03	.68 ± .03
Stanford Physiology G.P.	.67 ± .03	.46 ± .05	.56 ± .04
Stenquist Score	−.01 ± .06	.01 ± .06	−.01 ± .06
Stanford Arithmetic G.P.	.61 ± .04	.61 ± .04	.63 ± .04
Orleans Algebra Score	.63 ± .04	.67 ± .03	.74 ± .03

the type of ability measured by each. The r between physiology and mechanical aptitude was .18 ± .06, that between arithmetic achievement and algebra prognosis was .71 ± .03, and that between reading achievement and language prognosis .63 ± .03.

It is interesting to note that the highest degree of relationship is among the intelligence tests, the next between the intelligence and verbal group, and the next between intelligence and the mathematics and physiology group, and that there is no relation between intelligence and mechanical aptitude.

In response to the questions suggested, these data indicate that: (1) The Kuhlmann-Anderson agrees somewhat more closely with the results of the Orleans than do those of the Terman or Otis, though the reliability of the difference is questionable. (2) The Terman shows a similar unreliably closer agreement with physiology grade placement. (3) The Stanford Arithmetic Test agrees more closely with algebra prognosis than either the Terman or Otis, approaching the Kuhlmann-Anderson.

Table III presents a detailed description of the test data segregated according to record in algebra. The "Recom-

TABLE II
Description of Groups

COMPARISON IN	SUB-GROUP	MEAN	SIGMA OF DISTRIBUTION	SIGMA OF MEAN	RANGE
Chronological Age	Recommended	169.3	6.1	0.8	155–191
	Satisfactory	169.3	5.1	1.2	155–180
	Not Elected	171.5	6.7	0.9	159–197
Terman IQ	Recommended	116.8	14.5	2.0	83–149
	Satisfactory	106.9	8.0	1.9	94–119
	Not Elected	104.5	11.0	1.5	69–129
Otis IQ	Recommended	118.6	17.5	2.4	80–153
	Satisfactory	108.3	11.3	2.7	82–126
	Not Elected	102.9	16.2	2.3	74–148
Kuhlmann-Anderson IQ	Recommended	116.2	15.5	2.2	83–154
	Satisfactory	106.6	5.5	1.3	96–114
	Not Elected	104.0	11.5	1.6	82–134
Stanford Reading G.P.	Recommended	8.4	1.4	0.2	4.4–10+
	Satisfactory	7.7	1.3	0.3	4.8–9.8
	Not Elected	7.3	1.4	0.2	4.8–10+
Luria-Orleans Language Prognosis Score	Recommended	80.5	34.1	4.8	14–167
	Satisfactory	62.6	23.4	5.6	15–109
	Not Elected	52.0	27.7	3.9	10–111
Stanford Physiology G.P.	Recommended	7.6	1.8	0.2	4.3–10+
	Satisfactory	6.8	1.1	0.3	4.2–8.7
	Not Elected	6.6	1.3	0.2	3.2–9.8
Stenquist Mechanical Aptitude Score	Recommended	57.7	12.4	1.7	36–82
	Satisfactory	53.7	11.3	2.7	29–74
	Not Elected	59.0	10.9	1.5	28–78
Stanford Arithmetic G.P.	Recommended	8.0	1.3	0.2	5.5–10+
	Satisfactory	6.7	0.6	0.1	5.7–7.7
	Not Elected	6.6	1.2	0.2	4.3–10+
Orleans Algebra Prognosis Score	Recommended	70.3	32.6	4.6	26–163
	Satisfactory	43.8	18.7	4.5	22–101
	Not Elected	40.8	17.4	2.4	14–83

TABLE III

Summary of Ratios

COMPARISON IN	RECOMMENDED AND SATISFACTORY				RECOMMENDED AND NOT ELECTED				SATISFACTORY AND NOT ELECTED			
	D	σ_D	Ratio	Prob.	D	σ_D	Ratio	Prob.	D	σ_D	Ratio	Prob.
Chronological Age	0.0	1.5	0.0	50	N 2.2	1.4	N1.6	N 94	N 2.2	1.5	N1.5	N93
Terman IQ	R 9.9	2.8	R3.5	R100	R12.3	2.5	R4.9	R100	S 2.4	2.5	S1.0	S84
Otis IQ	R10.3	3.7	R2.8	R100	R15.7	3.3	R4.8	R100	S 5.4	3.5	S1.5	S93
Kuhlmann - Anderson IQ	R 9.6	2.5	R3.8	R100	R12.2	2.7	R4.5	R100	S 2.6	2.1	S1.2	S88
Stanford Reading G.P.	R 0.7	0.4	R1.8	R 96	R 1.1	0.3	R3.7	R100	S 0.4	0.4	S1.0	S84
Luria-Orleans Language	R17.9	7.4	R2.4	R 99	R28.5	6.2	R4.6	R100	S10.6	6.8	S1.6	S94
Stanford Physiology G.P.	R 0.8	0.4	R2.0	R 98	R 1.0	0.3	R3.3	R100	S 0.2	0.3	S0.7	S76
Stenquist Score	R 4.0	3.2	R1.2	R 88	N 1.3	2.3	N0.6	N 73	N 5.3	3.1	N1.7	N96
Stanford Arithmetic G.P.	R 1.3	0.2	R6.5	R100	R 1.4	0.2	R7.0	R100	S 0.1	0.2	S0.5	S69
Orleans Algebra Score	R26.5	6.4	R4.1	R100	R29.5	5.2	R5.7	R100	S 3.0	5.1	S0.6	S73

mended" group consists of the 51 students who elected algebra and did work of superior quality, usually defined as A or B. The "Satisfactory" group consists of the 17 students who elected algebra and did work of passing but not recommending quality, usually defined as C or D. The "Not Elected" group consists of the 53 students who did not take algebra, for the most part because they did not show aptitude for it. The "Not Elected" group is the most heterogeneous of the three because it includes those of non-college interest as well as those lacking in ability. In the case of algebra, however, those showing strong promise in mathematics were urged to consider it in the ninth year because of the possible later development of a college interest.

Apparently there is some systematic differentiation for all criteria except chronological age and Stenquist Mechanical Aptitude score. The extent to which the differences are reliable is presented in Table III.

In Table III the letter preceding the number indicates the superior group, and the probability column shows the chances in 100 that the obtained difference is a true difference.

In differentiating the Recommended from the Satisfactory group, the Stanford Arithmetic, Orleans Algebra, Kuhlmann-Anderson and Terman yield the most reliable differences in descending order as given. The difference between the Recommended and Not Elected groups is greater, as would be expected, the reliable tests in order being Stanford Arithmetic, Orleans Algebra, Terman, Otis, Luria-Orleans Language, Kuhlmann-Anderson Stanford Reading, and Stanford Physiology. The difference between the Satisfactory and Not Elected groups shows a consistent but in no case reliable result.

In terms of the question suggested, on the basis of these figures it seems that: (1) The Orleans Prognosis Test is somewhat superior to tests of general intelligence for the prediction of achievement in algebra, but (2) The Stanford Arithmetic Test is superior to both the Orleans Algebra and general intel-

ligence tests. (3) Differences between Terman Otis, and Kuhlmann-Anderson are so slight and vary so much in their direction that any conclusion regarding relative merit seems questionable.

Though these data establish reliable differences between total groups, Table II also showed the great overlapping. For individual prediction one needs to know not only which tests distinguish best but to what extent flexibility of interpretation of data is desirable. Table IV shows for the various tests the limits below which non-election seems advisable and above which superior accomplishment seems a certainty. The critical points are based on the ranges given in Table II. Tests marked by asterisks are those which, on the basis of Table III, seem of greatest validity in predicting achievement in algebra.

TABLE IV
Critical Scores

TEST OR TRAIT	PROBABLE NON-ELECTION	UNCERTAIN	PROBABLE RECOMMENDATION
Chronological Age	192–197	155–191	?
*Terman IQ	69–82	83–129	130–149
*Otis IQ	74–79	80–148	149–153
*Kuhlmann-Anderson IQ	82	83–134	135–154
Stanford Reading G.P.	?	4.4–10+	?
Luria-Orleans Language	10–13	14–111	112–167
Stanford Physiology G.P.	3.2–4.1	4.2–9.8	9.9–10+
Stenquist Mechanical Apt.	28	29–78	79–82
*Stanford Arithmetic G.P.	4.3–5.4	5.5–10+	?
*Orleans Algebra Score	14–21	22–101	102–163

The most outstanding impression one gains from such data is the great extent of overlapping between the groups. It may be caused by the heterogeneity of the Non-Electing group, by the unreliability of the grades used as a criterion, and most of all by the vast number of factors other than innate ability which affect success, as personality, study habits, degree of motivation and the like. At any rate, any attempt to establish definite

limits below which failure seems certain or above which success seems assured must be regarded with skepticism and interpreted with flexibility.

Because of the fact that most authors report results in terms of coefficients of correlation rather than critical ratios it seemed desirable to convert the data into that form for comparative purposes. The results in terms of biserial *r* are presented in Table V.

TABLE V

Correlation with Course Records

RELATION IN	RECOMMENDED SATISFACTORY	RECOMMENDED NOT ELECTED	SATISFACTORY NOT ELECTED
Chronological Age	.100 ± .112	−.212 ± .080	−.202 ± .108
Terman IQ	.420 ± .097	.542 ± .063	.136 ± .109
Otis IQ	.362 ± .101	.528 ± .064	.207 ± .108
Kuhlmann-Anderson IQ	.396 ± .098	.513 ± .065	.147 ± .109
Stanford Reading G.P.	.295 ± .104	.376 ± .073	.168 ± .109
Luria-Orleans Language	.323 ± .103	.523 ± .065	.230 ± .107
Stanford Physiology G.P.	.278 ± .105	.391 ± .073	.090 ± .110
Stenquist Mechanical	.192 ± .108	−.070 ± .082	−.278 ± .104
Stanford Arithmetic G.P.	.590 ± .083	.626 ± .057	.535 ± .087
Orleans Algebra Score	.490 ± .092	.618 ± .057	.099 ± .110

The interpretation as far as the relative merits of the various tests are concerned is the same as for Table III. In comparison with Lee's findings that the Kuhlmann-Anderson IQ correlates .56 with an algebra achievement test, the Terman .47, and chronological age −.35,[6] the present data indicate less difference between Terman and Kuhlmann-Anderson and less significance for chronological age. His *r* of .83 between Terman and Kuhlmann-Anderson is slightly greater than that given in Table III.

CONCLUSION

In the light of the data here presented, the following conclusions seem justified.

[6] Lee, J. Murray, "Predicting Success in Algebra and Geometry," *School Review*, 1934, 42, 188–196.

1. The New Stanford Arithmetic Test, Orleans Algebra Prognosis Test, and the Terman, Kuhlmann-Anderson and Otis Intelligence tests accurately differentiate degree of success in elementary algebra.

2. The assumption that the Kuhlmann-Anderson Test better predicts success in algebra than the Terman or Otis is questionable because of conflicting evidence. In any case, an algebra prognosis or arithmetic test seems to yield more reliable data than any intelligence test.

3. Critical scores are of doubtful value because of the great extent of overlapping between groups.

4. The tests studied here appear to differentiate degrees of success as well as probable non-success.

5. Test data two years old have validity as a basis for prediction when interpreted in terms of relative status.

6. The independence of the Stenquist Mechanical Aptitude Test is apparent.

7. The total test picture modified by subjective estimates of personal factors is a better indicator of probable success than any single test.

THE USE OF GROUP INTELLIGENCE TESTS WITH CORRECTIONAL SCHOOL SUBJECTS

ROYAL B. EMBREE, JR.*
University of Minnesota

THE use of group tests for the measurement of intelligence has become a generally accepted procedure for dealing with typical or nearly typical subjects. However, there has been a persistent belief that the individual mental examination is required for certain atypical groups, even though the majority of cases involved may be able to respond satisfactorily to the language requirements of group tests. There are atypical situations in which the use of ordinary group methods is manifestly impossible, but there are others in which it seems that group examinations may be used to excellent advantage. One example of the latter is the correctional school for juvenile delinquents.

A variety of reasons may account for the reluctance of many such institutions to rely upon the results of group intelligence tests in their measurement programs. A potent factor lies in the traditional association between individual testing and delinquency, which is reflected by the widespread use of individual tests in juvenile court work. Other reasons are the generally lower measured intelligence of delinquent groups and the relatively high percentage of children from foreign homes in such groups. Perhaps another explanation lies in the fact that many people persist in considering the results of individual examinations, regardless of quality, to be superior to those derived from single or combined group tests.

The diagnostic value of individual examinations is unquestionable, and it is obvious that group tests possess this capacity

* The writer wishes to express his thanks to Miss Eliza Griffin, Social Historian of the Connecticut School for Boys, for her valuable assistance in the accumulation of data used in this study.

to a lesser degree. However, experience indicates that intelligence test results are used primarily for purposes of classification in correctional school procedure, and the diagnostic value assumed for such routine examinations may easily be overestimated.

The group test, if it is sufficiently reliable and valid for the groups with which it is used, should be quite adequate for all purposes of classification. Programs based upon the use of group intelligence tests would free the resident psychologist from a heavy burden of routine examination, and would provide satisfactory measurement in institutions which had no facilities for individual testing.

The present study includes an investigation of the group intelligence test as used in one correctional school and suggestions regarding the establishment of an adequate group testing program for such institutions.

THE SETTING OF THE INVESTIGATION

All group tests included in the examination analysis were given within a few weeks after commitment to subjects entering the Connecticut School for Boys between October, 1934, and June, 1935. This institution, located at Meriden, Connecticut, is the state correctional school for boys. Its charges are committed by the various courts of the state, and they must, by legal requirement, be between six and sixteen years of age at the time of original commitment.

The examination used was Form 2 of the Illinois General Intelligence Scale.[1] The Illinois tests which are considered in the study were administered by the school psychologist or by a specially trained teacher. All examinations were given to groups of ten or fifteen individuals under the environmental conditions surrounding the routine testing program of the institution. The manual of directions was carefully followed in the administration and scoring of the tests, and Illinois intelli-

[1] The Illinois General Intelligence Scale. Public School Publishing Company, Bloomington, Illinois. 1926 Revision.

gence quotients included in the study are taken from the tables furnished by the authors. They use the coefficient of brightness for chronological ages above fourteen, so the quotients determined at the upper age levels are somewhat higher than would be the case with ordinary calculations based upon uncorrected ages.

Two groups are utilized in the investigation. Group I is composed of the one hundred two subjects whose examinations were used to determine the reliability and the intercorrelations of the Illinois test. Group II consists of eighty-one individuals who were given both the Illinois group test and a Stanford Binet individual examination. Both groups represent satisfactory samples of that portion of the institution's population which is able to respond to the group test situation.

The reliability coefficient and the relationships between subtests of the Illinois examination were based upon Group I, and the distributions of intelligence quotient and chronological age for this group appear in Table I.

Intelligence quotients for Group I range from 54 to 130 and are distributed about a mean of 89.5 with a standard deviation of 17.9. This group is almost identical with the entire institution in dispersion, but the mean is somewhat higher. Chronological ages range from eleven years, five months to seventeen years, three months, with a median of fifteen years, one month, and a quartile deviation of ten months. These figures closely approximate the age distribution for commitment to the institution. The ten individuals beyond the legal commitment age of sixteen include recidivists, boys who became sixteen before they were tested, and boys whose suspended sentences were put into effect after they had actually passed the commitment age.

The Connecticut School for Boys, like many eastern institutions, receives a large number of individuals from foreign homes. The vast majority is composed of second generation foreign stock. That Group I represents a fair sample of these nationality groups is evidenced by Table II, which includes the one hundred two individuals of Group I and a percentage dis-

TABLE I

Distribution of Intelligence Quotient by Chronological Ages for Group I

IQ*	CHRONOLOGICAL AGES*						
	11–0 11–11	12–0 12–11	13–0 13–11	14–0 14–11	15–0 15–11	16–0 & above	IQ Total
121–130			1	1		2	4
111–120		2	1	1	4		8
101–110		1		3	10	2	16
91–100	1	4	3	3	11		22
81– 90	2		2	6	7	2	19
71– 80	1		1	4	7	1	14
61– 70		3	2	3	4	3	15
51– 60	1			2	1		4
Total	5	10	10	23	44	10	102

* IQ: Mean = 85.9 S.D. = 17.9 Age: Median = 15–1 Q = 10 mos.

tribution based upon the entire population of the school as of June, 1935.

Group II, which is utilized in the validation of the Illinois test through comparison with Binet examinations, contains eighty-one cases. Individuals in this group were examined between September, 1933, and January, 1937. A few of Group

TABLE II

Nationality Distribution of Subjects in Group I

NATIONALITY	NUMBER IN GROUP I	PER CENT GROUP I	PER CENT ENTIRE SCHOOL
Polish	24	23.5	21.5
Italian	24	23.5	24.8
American White	21	20.6	24.7
American Negro	14	13.7	7.7
French Canadian	5	5.0	3.6
Others*	14	13.7	17.7
Total	102	100.0	100.0

* Includes the following: Lithuanian—3, German—2, Czech—2, Russian—2, Austrian—1, Portuguese—1, Greek—1, Jewish—1, and Norwegian—1.

II appear in Group I, but the majority does not. All Illinois tests were administered in the course of its routine use in the correctional school program. Some of the Stanford Binet examinations were given by the school psychologist, and others by the psychometricians employed by the juvenile courts or the State Department of Special Education.

The distributions of Group II are not included in this article. The mean Illinois intelligence quotient is lower than that of Group I, and closer to the mean of the entire population as of January, 1935. There is little difference between the standard deviations of Groups I and II, and Group II is also a reasonable sample of the nationalities represented in the institution.

RELIABILITY AND INTERNAL ANALYSIS OF THE GROUP EXAMINATION

The Illinois intelligence examination consists of seven sub-tests, each representing a common approach to the measurement of intelligence. These sub-tests, with the numbers which will be used to identify them in some subsequent consideration, are as follows: 1. Analogies, 2. Arithmetic Problems, 3. Sentence Vocabulary, 4. Substitution, 5. Verbal Ingenuity, 6. Arithmetical Ingenuity, and 7. Synonym-Antonym.

The reliability of the examination was determined by the correlation of odd and even items for the total of all sub-tests, on the basis of the one hundred two cases in Group I. Since the Synonym-Antonym test is scored by deducting the number of incorrect responses from the number of correct responses, the calculation of odd and even totals was handled in the same manner for this test. Preliminary investigation showed that making this correction appreciably lowered the reliability coefficient of this particular sub-test, but it is obvious that reliability should be determined upon the same basis which is used for scoring. The zero-order coefficient of correlation between odd and even totals for Group I was .954. The reliability coefficient, determined by the Spearman-Brown Prophecy Formula,

is .977. The standard error of an intelligence quotient for the group under consideration is approximately three points.

It is evident that the Illinois test in this setting is sufficiently reliable for both individual and group classification. The wide spread in both intelligence and chronological age undoubtedly acts to increase the correlation in this case. However, Group I is characteristic of the population with which the test is used, and it seems likely that more narrow grouping would still produce a relatively high reliability coefficient. In the Connecticut School for Boys, both intelligence quotient and age vary widely within individual grade levels, and intelligence quotient varies widely within each age classification.

TABLE III

Correlational Analysis of the Illinois Intelligence Test upon the Basis of Group I

	2	3	4	5	6	7	TOTAL
1	.515	.569	.142	.568	.459	.583	.798
2		.693	.429	.687	.485	.657	.782
3			.382	.843	.433	.759	.867
4				.427	.211	.451	.645
5					.488	.687	.877
6						.407	.578
7							.864

Intercorrelation was undertaken in order to determine the relative contributions of the various sub-tests. Table III includes the inter-correlations among the various sub-tests and the correlation between each sub-test and the total score. The part-whole correlations are spurious to the extent that they are affected by the inclusion of individual tests in the total score when the same test is being used as one variable.

When considered as a whole, the examination stands up well under this analysis. Inter-correlations are almost uniformly smaller than correlations between the separate tests and the total score, the sole exception being the high relationship discovered between sentence vocabulary and verbal ingenuity.

The analysis indicates that each test makes a separate contribution, although there is, of course, considerable overlapping. There is a relatively high agreement between sentence vocabulary and other tests with a heavy verbal emphasis. The two tests possessing the least verbal factor, Substitution and Arithmetical Ingenuity, exhibit low correlations with the remaining tests and with each other, but they also correlate more poorly with the total, which is, to be sure, weighted in favor of more verbal exercises. In general, however, this analysis indicates a satisfactory condition of low internal relationships accompanied by high relationships between the various parts and the whole.

FOREIGN HOME BACKGROUND AS A FACTOR IN TEST RESULTS

Studies of the effect of foreign home background upon intelligence quotients derived from group and individual tests have been reported by a number of workers. The implications of such studies are conflicting, and the problem appears still unsettled. In 1922, Brown[2] presented a study in which children from foreign-speaking homes were given Stanford Binet examinations in English when it was understood and in the native language when there was doubt of understanding. Language difficulty tended to disappear after a few years of schooling, and children then did as well in English as in the native tongue. In 1927, Mead[3] studied the results of group tests used with Italian children whom she found to be working under a serious handicap. During the same year, Jones[4] administered verbal and non-verbal group tests to children from American and non-English speaking homes. The relationships between the two groups were approximately the same for the verbal and

[2] Brown, Gilbert S. "Intelligence as Related to Nationality." *Journal of Educational Research*, 5: 324–327, April, 1922.

[3] Mead, Margaret. "Group Intelligence Tests and Linguistic Disability among Italian Children." *School and Society*, 25: 465–468, April 16, 1927.

[4] Jones, Vernon A. "A Study of the Non-Verbal Nature and Validity of Myers Mental Measures." *Journal of Educational Research*, 16: 203–209, October, 1927.

non-verbal tests. Senour,[5] reporting in 1934, also approached the problem with verbal and non-verbal measures, concluding that children from foreign homes were not adequately measured by verbal tests alone, and that non-language tests should be used as supplements in such cases. None of these studies is conclusive, and all alike are marked by the absence or uncertainty of adequate control.

The present study did not involve enough cases to permit a serious approach to this problem. However, five nationality groups were selected, matched in age, and compared, by the analysis of variance technique, upon the most verbal and the least verbal sub-tests in the Illinois scale. Tests used were Sentence Vocabulary and Substitution. Groups considered were Italian, Polish, American, Negro, and Others. There was no evidence that the groups differed essentially in their reactions to either the vocabulary test or the largely non-language substitution test. The samples were so small, though, that the result can be considered only as an indication of the need for better controlled investigation involving more extensive groups.

In a further attempt to discover whether this correctional school group suffered from a verbal handicap, the scores of Group I on separate tests were compared with similar scores for a normal high school group having the same total score. These figures were taken from the Manual of Directions of the Illinois Test,[6] and are based upon three hundred fifty-nine pupils in

TABLE IV

Comparison of Group I with an Average High School Group with Respect to Mean Scores on Illinois Sub-Tests

	TOTAL	1	2	3	4	5	6	7
Bloomington	73.00	8.35	7.24	13.05	15.28	10.59	8.59	10.32
Group I	73.36	9.77	6.91	12.42	16.06	10.07	8.66	9.47

[5] Senour, A. C. "Necessity for Use of a Non-Language Mental Test in Group Intelligence Testing." *Journal of Educational Research*, 27: 435–441, February, 1934.

[6] Manual of Directions. Page 17. Illinois General Intelligence Scale, Public School Publishing Company, Bloomington, Illinois. 1926 Revision.

the public schools of Bloomington, Illinois. Results of this comparison appear in Table IV.

The two groups are closely alike on all tests, and there is no indication that the more verbal exercises discriminate against the correctional school subjects.

VALIDITY OF THE GROUP EXAMINATION

A measure of the validity of the group test was secured by correlating the Stanford Binet and Illinois intelligence quotients determined for the eighty-one cases included in Group II. The administration of these examinations has already been described. The use of the Binet as a measure of validity depends upon the assumption that it is, itself, a valid measure of intelligence in this setting. Since the Stanford Binet examination has generally been relied upon for measurement in the correctional school situation, this assumption seems justifiable upon pragmatic grounds, although the independent validation of the two tests would be productive and interesting.

The zero-order coefficient of correlation between the Stanford Binet and Illinois intelligence quotients of Group II was .849, and its standard error was .031. Corrected for attenuation, with a reliability coefficient of .90 assumed for the individual examination, the coefficient of correlation between the two tests is .905. This indicates a relatively high relationship between the results of the two examinations as they are used with children in the Connecticut School for Boys. Depending upon whether the actual or the hypothetically corrected coefficient of correlation is considered, from seventy-two to eighty-two per cent of the variance of one measure is associated with the variance of the other.

The Illinois test, administered to groups and requiring sixteen minutes of working time, supplies a good approximation of the same traits which are measured by individual Binet examination. The standard error of a Stanford Binet intelligence quotient estimated from an Illinois intelligence quotient is 8.6 points for the group under consideration, when based upon the

uncorrected coefficient of correlation between the two examinations. This is but two points higher than the standard error of a single Binet intelligence quotient for this group, which is 6.4 points if the hypothetical reliability coefficient mentioned above is assigned to the Binet examination.

In concluding this portion of the study, it may be said that the group intelligence test, as used in the setting described, supplies a reliable intelligence quotient which is in good agreement with the results of individual examinations. Further analysis demonstrates that the Illinois test samples a number of traits which correlate well with its total result, and that the more verbal exercises do not discriminate against the group to which it was given.

A SUGGESTED GROUP TEST PROGRAM

It has been shown that a single group test can function adequately in measuring the intelligence of correctional school charges who fall within its range of application. However, the use of a battery of several tests would undoubtedly increase the accuracy of measurement. It is difficult to determine exactly the point at which the principle of diminishing returns reaches full effect, but it is probable that three tests are sufficient to constitute a very effective battery. They will furnish at least an hour of exposure to test situations, and the use of an odd number makes the calculation of a median value a simple matter.

Three or more tests may be given at one administration to certain groups, but it is likely that the use of several administration periods would be more effective with children recently committed to a correctional school. If intelligence tests are preceded by a standardized test of school achievement, those individuals competent to handle the group examination may readily be selected. A battery of three intelligence tests can be administered within a total elapsed time of an hour and one-half, and the procedure, even if used for occasional individual cases, would require very little more time than a Binet examination.

When ten or fifteen subjects are involved, as is likely to be the case in a correctional school, the utilization of group tests makes possible a great economy of time.

The use of several tests raises a new problem of interpretation. The variation in intelligence quotients determined for the same individuals by various tests has been pointed out by Miller.[7] However, in the same article, he suggests a convenient method for reducing the test results to a common basis. The procedure involves the equation of tests upon the bases of means and standard deviations for the intelligence quotients resulting from the various examinations, and it will be described briefly and illustrated in this study. For a more comprehensive treatment, the reader should consult the original publication.

The method of equation will be described in a hypothetical correctional school situation. A fundamental requirement of the process is the administration of the various tests to a reasonably large group of the same individuals under circumstances as nearly identical as is possible. Ideally, the three tests selected for the battery should be given to all members of the institution, for this would supply immediately the necessary data. If this is not possible, the three examinations may be administered successively to children as they are admitted until a group of one hundred or more has been accumulated. The tests always should be given in the same order and under identical surroundings, insofar as this is possible. If it is decided to use several administration periods, the plan should be followed whenever the battery is administered.

When data are complete, the means and standard deviations of intelligence quotient for each test should be computed. The process of equation is simplified by the construction of a graph such as is represented in Figure 1, and which, in this case, is based upon the Illinois and Binet intelligence quotients for Group II at the Connecticut School for Boys. Standard deviations above and below the mean are placed on the vertical axis,

[7] Miller, W. S. "The Variation and Significance of Intelligence Quotients Obtained from Group Tests." *Journal of Educational Psychology*, 15: 359–366, September, 1924.

while intelligence quotient points are indicated on the horizontal axis. Each test then is represented in linear form by plotting its mean and standard deviations on the scale. The intelligence quotients of various tests are readily equated by reading horizontally from one line to another, thus determining the score value of one in terms of the other at all points on the scale. Equation can also be made by converting the intelli-

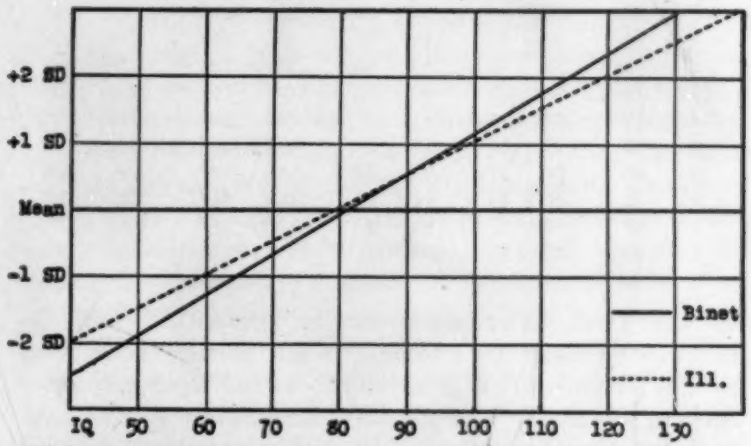


FIGURE 1. Graph for equating Binet and Illinois intelligence quotients, based upon Group II, Connecticut School for Boys. Binet: Mean = 81.3, S. D. = 16.3. Illinois: Mean = 79.4, S. D. = 19.6.

gence quotients of each test into standard scores or percentiles.

Implicit in the use of these techniques for equation is the assumption that the mean represents the same level of achievement for all tests, regardless of differences in the intelligence quotients assigned by test norms. Likewise, standard deviations in all cases are assumed to represent the same absolute variabilities in measured mental ability.

When the graph has been constructed, a conversion table may easily be prepared. This has been done for the data used in Figure 1, and the results appear in Table V.

When more than two tests are used, it is necessary to select

TABLE V

Table for Converting Illinois Intelligence Quotients into Their Binet Equivalents

BIN.	ILL.	BIN.	ILL.	BIN.	ILL.	BIN.	ILL.	BIN.	ILL.
55	47	69	65	83	81	97	99	111	115
56	49	70	66	84	83	98	100	112	117
57	50	71	67	85	84	99	101	113	118
58	51	72	68	86	85	100	102	114	119
59	52	73	69	87	86	101	103	115	120
60	53	74	71	88	87	102	105	116	122
61	55	75	72	89	89	103	106	117	123
62	56	76	73	90	90	104	107	118	124
63	57	77	74	91	91	105	108	119	125
64	59	78	76	92	92	106	109	120	126
65	60	79	77	93	94	107	111	121	128
66	61	80	78	94	95	108	112	122	129
67	62	81	79	95	96	109	113	123	130
68	63	82	80	96	97	110	114	124	131

one with which the remaining tests are equated. If Binet intelligence quotients are available, it may be well to use them for this purpose. If they are not to be had, some group test which agrees closely with the Binet examination may be used. The reduction of results to Binet equivalents places the measurement program upon a basis comparable with others which follow the same procedure. When several tests are used, it is probable that the median value of the equated intelligence quotients represents the most satisfactory figure for general use.

The appearance of the 1937 Stanford Revision of the Binet scale makes equation imperative. Because the standard deviation of intelligence quotients is appreciably greater for the new than for the original Stanford Revision, there will be marked differences toward both extremes between intelligence quotients based on the 1937 Stanford Binet and those based on the 1916 Revision or on any group test which produces a distribution of similar dispersion. The need for equation of group test results with the 1937 Stanford Revision will depend upon the extent of its use by agencies with which the institution deals, but it

appears likely that a basis for comparison will become increasingly necessary.

It should be emphasized that each institution must set up its own basis for equation upon data which represents a satisfactory sample of its particular population. There is no positive guarantee that results determined for one group will be satisfactory for another.

In conclusion, it may be said that experience in the Connecticut School for Boys indicated that the group test can function adequately with children of all intellectual levels whose reading ability is at least of third grade quality, excepting unavoidable cases of disordered personality or extreme negativism. High agreement between the group and individual tests sometimes obtained below this level, but third grade reading ability, as measured by standardized achievement tests, provides a safe line of demarcation. Below this point, non-verbal or individual examinations are preferable in most cases. During the period under consideration, approximately 80 per cent of the children admitted were able to take group examinations. However, the importance of careful observation and retesting of questionable cases by individual examinations can not be overemphasized.

PREDICTION OF VOCATIONAL PROFICIENCY IN THREE MACHINE OPERATIONS

ALBERT B. BLANKENSHIP
Psychological Corporation

AND

HOWARD R. TAYLOR
University of Oregon

I. THE PURPOSE

THIS analysis of the learning curves of operators in three machine processes was undertaken in order to determine the significance of work samples in each process as a basis for the selection of workers.

II. THE SCOPE

The study made use of the records of a total of 190 women workers in the three machine operations in the Jantzen Knitting Mills of Portland, Oregon. In the trimming operation there were 27 completes and 29 incompletes;[1] in the covering operation, 37 completes and 39 incompletes; and in the hemming operation there were 23 completes and 35 incompletes. In securing this number of records it was necessary to include all usable records for the period from 1924 to 1931.

III. THE WORK SITUATION

(1) *Description of the processes.* All of the operations are performed on high-speed machines similar in appearance to the common home sewing machine. In each operation several different movements must be learned, and the particular style of suit determines the combination of movements. The three operations vary from one another in the essential task involved: seam-sewing is called trimming, stitching of the seams is called covering, and sewing of hems is called hemming.

[1] Records were secured for each of the three operations studied for workers who had remained with the company throughout the period of learning (the completes), and for those who had left the employ of the company for various reasons before the learning period was complete (the incompletes).

(2) *Training.* There is no definitely-planned training procedure. Each new worker is placed under the general supervision of the forelady in the operation she is to learn, and under the specific supervision of an experienced hand. After several hours of observation and instruction she is placed on "her own."

(3) *Payment plan.* The Jantzen Company uses the Bedaux System in paying its workers.[2] As this system works in the Jantzen Mills, each operator is guaranteed a basic hourly wage, and if a point above the "standard production"[3] is attained, she is paid according to the amount by which the standard is exceeded.

IV. HOW THE DATA WERE GATHERED

Work sheets, containing a record of the average number of Bedaux units per hour produced by each worker each day, were used as the source of the data. A sample of the production for each week for each worker was secured. In each case the first recorded sample was the production record of the first day worked by the operator, and every fifth day worked from then on was recorded. In the trimming operation 40 weekly samples were taken, whereas 50 were necessary in covering and hemming.[4] As previously explained, the records were secured for both completes and incompletes.

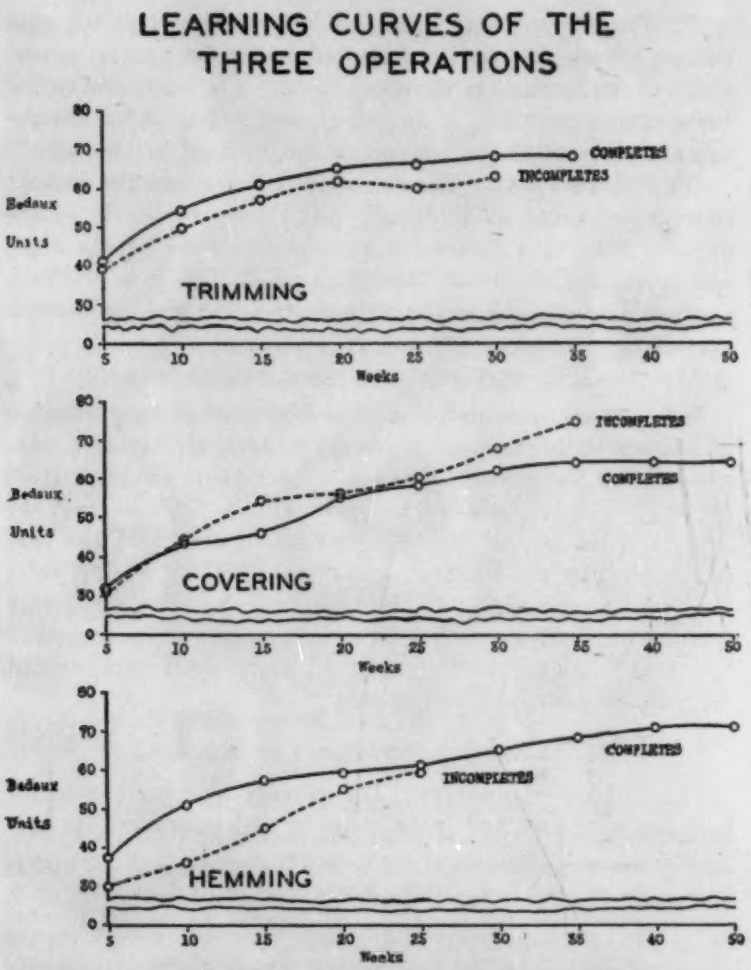
V. STATISTICAL TREATMENT OF THE DATA

(1) *The learning curves.* The average learning curves for both the completes and incompletes in each operation are pre-

[2] For a general discussion of the Bedaux System see C. C. Balderston, V. S. Karabasz, and R. P. Brecht, Management of an Enterprise. New York: Prentice-Hall, 1935, p. 211, or C. Bedaux, The Bedaux-unit principle of industrial measurement, J. Appl. Psychol., 1921, 5, 119–126. For the method of payment in the plant see the Manual for Members of the Jantzen Organization, published Jan. 1931.

[3] As an approach to the psychological factors in obtaining time and motion study data and in setting standards of production, the Industrial Division of the Psychological Corporation has developed an Operator-Job Specifications Chart.

[4] The length of the weekly samples was arrived at after consideration of learning curves supplied by Carl Vreeland, of the Jantzen Mills.



sented in the figures on page 520.[5] The curves all show the four characteristics usually mentioned by psychologists in connection with learning curves, (1) a sharp rise in the early

[5] The figures represented by the curves are trends, rather than actual output. All of the curves have been smoothed by the moving average method, so as to present a simpler, clearer indication of *tendencies*.

part of the curve, (2) negative acceleration, (3) plateaus, and (4) a point after which little more improvement occurs, and thus the curves may be called "typical."[6]

In trimming and hemming the completes as a group are consistently superior in output to the incompletes; hence it is likely that inferiority on the job in these operations is at least one reason for leaving the company. In covering, however, first one group and then the other excels (though this tendency is more apparent in the raw averages than in the smoothed curves). Hence the covering operators who leave the employ of the company before the learning period is complete presumably do so for reasons other than inferiority at the work.

The covering curves rise most gradually, and the trimming curves rise most sharply, while the curves for hemming are intermediate in slope.[7] A knowledge of the operations indicates that covering is the most complex of the three operations, followed by hemming and trimming, in that order, which probably accounts for the differences in the slopes of the curves.

(2) *Reliability of production records.* There are a number of possible explanations for the generally low correlations which, as would be expected from these results, were found when single samples of output were correlated. (The table indicates that in order to secure reliabilities of .9, the number of weekly samples must be from 5 to 22, depending upon the operation, and the point in the learning curve.) E. B. Mittelman, University of Oregon, found in an unpublished study of the inspection department of the Jantzen Mills that individual records fluctuated more in times of prosperity than in depression. Presumably this was because of (1) lack of worry about keeping the job, and (2) high pay. The worker could easily get another job if the present one were lost. She was earning plenty of

[6] See, for a discussion of "typical" curves, J. A. McGeoch, The acquisition of skill, Psychol. Bull., 1927, 24, 437–466.

[7] The curves should be directly comparable, since one of the advantages claimed for Bedaux Units is the fact that they represent the standard output per minute for each kind of work.

TABLE I

Showing the Reliability of Samples of Average Hourly Output in Bedaux Units, Taken at Intervals of Five Days at (a) The Beginning, and (b) the End of the Learning Period in Each Operation

r OF WEEKLY SAMPLES 1–10 WITH :	TRIMMING (N = 27)	COVERING (N = 37)	HEMMING (N = 23)
r of avg. output on 1, 11, 21, 31 and 41st day vs. avg. output on 6, 16, 26, 36 and 46th day (Samples 1, 3, 5, 7, 9, vs. 2, 4, 6, 8, 10)	.87(±.03) (7)[a]	.67(±.06) (22)	.91(±.02) (5)
r of avg. output on 151, 161, 171, 181 and 191st day vs. avg. output on 156, 166, 176, 186 and 196th day (Samples 31, 33, 35, 37, 39 vs. 32, 34, 36, 38, 40)	.81(±.04) (11)	.....	.....
r of avg. output on 201, 211, 221, 231 and 241st day vs. avg. output on 206, 216, 226, 236 and 246th day (Samples 41, 43, 45, 47, 49 vs. 42, 44, 46, 48, 50)	.....	.88(±.02) (6)	.91(±.02) (5)

money, so needed to work at full capacity only when she desired some particular luxury.

Still more important in this connection is the practice of the company in regard to work which does not pass inspection. Unacceptable goods are not deducted from the record of output for the day on which they were produced, but must be brought up to standard on the workers' own time the next day. Thus the record would frequently give a worker an unduly high out-

[a] Figures appearing below the correlation coefficients in this table are the number of samples needed to secure a reliability of .9 in each operation, as estimated from the reliability coefficient appearing above the figure in each case. To secure these figures, Formula 159 on page 206 of T. L. Kelley, Statistical Method, New York: Macmillan, 1923, was used.

put one day, and an unduly low output the day following. This would be just as likely to occur in weekly samples taken at random as in daily ones.

Another possible explanation is the periodicity of women. However, a number of studies indicate that menstrual periods have little or no effect upon the quantity or quality of production.[9]

(3) *The validity of the samples.* No matter how consistent we make the measures of early proficiency by increasing the number of samples, their value in selecting employees will still depend almost entirely on how well they predict the long time desirability of workers. Probably the simplest criterion of ultimate worth is rate of production at the end of the learning period. The relative standing of each worker on the last ten weekly samples was considered a good measure of this, but correlations with total output exclusive of the work sample were also included in Table II.

TABLE II

Showing the Relationship between Early and Later Proficiency in Each of the Three Operations

R OF WEEKLY SAMPLES 1–10 WITH	TRIMMING (N = 27)	COVERING (N = 37)	HEMMING (N = 23)
weekly samples 41–50 (in the case of trimming, 31–40)	.61(±.08)	.01(±.11)	.27(±.13)
weekly samples 11–50 (in the case of trimming, 11–40)	.68(±.08)	.01(±.11)	.66(±.08)

So far as covering is concerned there appears to be no relation at all between early and later proficiency nor can we be statistically sure of any relation between production in the early as compared with the final stage of learning to do hemming. In trimming—and in hemming when all the later samples are combined—there does seem to be a fairly definite relation between early and later proficiency. Since all the

[9] The paper by O. M. Lough, The effect of functional periodicity on the learning process, J. Genet. Psychol., 1937, 50, 307–322, is typical of these studies.

measures used have estimated reliabilities ranging from r_{11} = .80 to .95, chance errors in the measures themselves cannot be responsible for the insignificant relationships found nor would correction for attenuation markedly increase those which do appear to be significant.

There are, however, many aspects of desirability as an employee which may be inadequately reflected in average hourly production. For example these three operations required an exceptionally long period of training in comparison with other jobs in the same plant and in comparison with typical industrial processes.[10] This makes labor turnover unusually expensive.[11]

Moreover workers receive a base rate of pay with a bonus for piece work in excess of the standard 60 Bedaux units per hour (which was set by a time study), well within the capacity of any—not just the average—experienced worker. Hence the sooner any operative attains a standard rate of production the better for all concerned—other things being equal. Accordingly the work samples were correlated with these two additional criteria (a) length of service[12] and (b) time required to attain standard rate of production as appears in Table III.

[10] Carl Vreeland, of the Jantzen Knitting Mills, found the average learning period in trimming was 16 weeks, in covering 23 weeks, and in hemming 13 weeks, whereas in H. C. Link, Employment Psychology, New York: Macmillan, 1919, a job analysis showed that for 76% of 18,000 workmen no previous training was necessary. Their work could be learned on the job in periods varying from an hour to a month. The average learning period required was 10 days.

[11] In 1929, there was a general labor turnover of 40% in the Jantzen plant, not including seasonal layoffs. In the trimming department it was 46%, in covering 76%, and in hemming 33%. Average turnover for the three departments was 52% which is considerably above plant average, as well as more costly because of slower learning.

[12] As already indicated, workers were divided into completes and incompletes. On the basis of this dichotomy (all workers with 10 weeks or more of service were included) a biserial r was computed with the average of the output of the first ten weekly samples for each worker.

TABLE III

Showing the Relationships between Early Proficiency, Length of Service, and Weeks to Reach Standard Rate

	TRIMMING	COVERING	HEMMING
r of weekly samples 1–10 with length of service	.20(±.10) (N=37)	.38(±.08) (N=55)	.66(±.08) (N=36)
r of weekly samples 1–10 with weeks to reach standard rate	.66(±.08) (N=27)	.41(±.09) (N=37)	.32(±.13) (N=23)

These results suggest that early proficiency is with the possible exception of the operation of hemming definitely related to the important questions of how rapidly the workers learn and how long they will remain with the company.

Finally, Table IV shows that speed of learning in each operation is closely related to average hourly output for the whole period.

TABLE IV

Showing the Correlation between Weeks Required to Reach Standard Production and Average Output

	TRIMMING (N=27)	COVERING (N=37)	HEMMING (N=23)
r of weeks required to reach rate of 60B with average hourly production for 40 weeks in trimming, 50 weeks in the other operations	.74(±.06)	.52(±.08)	.59(±.09)

These consistently high correlations of output with rapidity of learning, which is itself definitely related to early proficiency, suggest that there must be some factors making for negative correlation between records of output and early proficiency, particularly in the operation of covering. If these could be discovered and allowed for, work samples might prove to be quite useful in selecting employees. Unfortunately the number of cases available does not warrant partial and multiple correlation analysis.

VI. SUMMARY

The learning curves of 190 women workers in three machine processes were analyzed. Work samples indicating early proficiency in the operations did not seem to provide a very satisfactory basis for selecting employees because of the extensive sampling necessary to secure adequate reliability and because correlations with output were not consistently high. They did, however, indicate fairly well the workers who reached a standard rate of production most rapidly. Changes in methods of training might, of course, modify any of these findings considerably, but at present selection in terms of early proficiency is hardly justified.

A STUDY OF THE VOCATIONAL INTERESTS OF A GROUP OF TEACHERS COLLEGE FRESHMEN

DEWEY B. STUIT

State University of Iowa

STUDIES in psychology and education show conclusively that interests play an important rôle in the dynamics of human behavior. It is an established fact that an individual's interests as well as his abilities will affect his educational and vocational adjustment. Indifference and disinterest are factors which frequently contribute to an individual's lack of success in occupational life. For this reason a college personnel program would hardly be complete if no provision were made for the measurement of student interests. This is particularly true of a professional college. If interests play a part in vocational success, the student in a professional college should have the opportunity to investigate his interests and perhaps reexamine his vocational objective in the light of evidence furnished through such measurement. It was with this purpose in mind that a program of interest measurement was undertaken in the Teachers College of the University of Nebraska.*

The Strong Vocational Interest Inventory was administered to all freshmen enrolled in the orientation course[1] of the Teachers College. Form B was administered to the men and Form WB to the women. Originally it was planned to request a scoring fee from each student, but certain administrative regulations prevented the execution of this program.

* This study was conducted while the writer was a member of the faculty at the University of Nebraska.

[1] All new students with less than twenty hours of university credit are required to take this course. For a description of the course see, Stuit, D. B., "Freshman Personnel Work in the Teachers College of the University of Nebraska." *School and Society* 45: 887–88, June 26, 1937.

Scoring was then placed on a voluntary basis, and approximately half of the class responded by paying thirty-five cents for scoring the inventories in nine occupational fields.[2] Of this group of 109 students 94 were women and 15 were men. A large number of the remaining tests were scored by hand in one occupation, namely, the teaching profession. The results obtained from the tests scored for nine occupations are listed in Tables 1 and 2.

TABLE 1

Ratings Obtained by Women in the Strong Inventory

	C	C+	B–	B	B+	A
1. Librarian	64	14	10	6	0	0
2. Physician	78	7	9	0	0	0
3. Life Insurance Saleswoman	60	14	10	6	2	2
4. Social Worker	68	19	3	3	1	0
5. Teacher of Social Sciences	63	10	8	10	2	1
6. Lawyer	54	14	10	5	9	2
7. Teacher of Mathematics and Physical Sciences	44	22	13	8	5	2
8. Nurse	9	6	16	25	13	25
9. General Office Worker	0	1	2	10	15	66

At first glance the results as shown in these tables are likely to appear rather disturbing, particularly in the case of women.

[2] High correlations between several of the occupations enable one to predict ratings in most of the other occupations on the basis of performance in the nine for which the tests were scored. In the case of women the correlations corrected for attenuation for the following groups are all above .80: I. Author, librarian, artist; II. Teacher of English, teacher in general, teacher of social sciences; III. Stenographer-secretary, general office worker, housewife. In the latter group the correlations are all above .88. For men the groups are as follow: I. Mathematician, physicist, engineer, chemist, physician, dentist, psychologist, architect, farmer, artist, carpenter; II. a. Lawyer, journalist, advertiser; II. b. Life insurance salesman, real estate salesman; III. a. Minister, teacher, musician; III. b. YMCA secretary, YMCA physical director, personnel manager, school superintendent; IV. Purchasing agent, office worker, accountant, vacuum cleaner salesman, policeman; V. Certified public accountant. The correlation of the occupation for which the test was scored with the remaining occupations in the same group is in each case above .60.

TABLE 2
Ratings Obtained by Men in the Strong Inventory

	C	C+	B–	B	B+	A
1. Certified Public Accountant	13	0	1	0	1	0
2. Chemist	13	0	0	1	1	0
3 Doctor	10	0	1	3	1	0
4. Lawyer	8	0	4	3	0	0
5. Life Insurance Salesman	9	0	4	1	0	1
6. School Management	5	0	0	3	2	5
7. YMCA Secretary	7	0	2	3	1	2
8. Office Clerk	3	0	0	5	1	6
9. Interest—Maturity (Ratings given in percentiles)						

Only 21 young women received better than C ratings in Teacher of Social Sciences, and 28 received better than C ratings in Teacher of Mathematics and Physical Sciences. In contrast all but one of the young women received ratings of B or better in General Office Worker, and 68 received B – or above ratings in Nurse. One of two things must be true. Either the inventory fails to measure women's interests or there is something about the vocational ambitions of freshman women in the Teachers College of the University of Nebraska which is responsible for the seemingly incongruous results. In order to determine if the latter was the case a study was made of the students' interests as expressed in an individual record form[3] which is filled in by all Teachers College freshmen.

On one page of the individual record form the student is asked to indicate his first, second, and third choices of the seven occupational fields listed. The occupational fields are as follows:

A. Occupations involving business contacts with people, such as the various fields of selling, promotional work, politics, etc.

B. Occupations involving business detail work, such as accountancy, business statistician, cashier, banker, stenographer, and office clerical work.

[3] The writer is indebted to Dr. E. G. Williamson of the University of Minnesota Testing Bureau for this record form.

C. Occupations involving social service activities, such as YMCA worker, Boy Scout executive, personnel worker, social case worker, teacher, welfare worker, etc.

D. Occupations requiring special artistic abilities, such as musician, actor, artist, interior decorator, designer, etc.

E. Occupations involving executive responsibilities, such as director, office manager, foreman, etc.

F. Occupations involving technical or scientific work, such as engineer, chemist, surgeon, architect, research worker, inventor, physicist, toolmaker, etc.

G. Occupations involving verbal or linguistic work, such as lawyer, newspaper man, author, advertising man, professor, librarian, etc.

In addition the individual is asked to list in order of preference the three occupations in which he would like to earn his

TABLE 3

*Tabulation of Occupational Field Ratings**

Occupation	MEN Choice 1 f	Choice 2 f	Choice 3 f	Occupation	WOMEN Choice 1 f	Choice 2 f	Choice 3 f
A	0	1	4	A	2	7	13
B	0	2	2	B	17	26	15
C	8	2	1	C	46	24	12
D	2	2	0	D	16	13	20
E	1	3	4	E	1	3	10
F	0	2	1	F	2	2	4
G	3	2	2	G	4	13	14
	—	—	—		—	—	—
	N** = 14	14	14		88	88	88

* Table III may at first glance prove to be somewhat deceiving. Several of the students who gave first choice to Occupations B and D are in reality interested in teaching commercial work and fine arts respectively. Table IV has been included to clarify this point. Naturally some individuals are taking commercial work and fine arts with a dual objective in mind. Upon completion of their courses the job opportunities at the time will determine whether they enter teaching or a work career in which they will practice their acquired skills.

** Due to the incompleteness of their individual record forms a few cases had to be omitted from this tabulation.

living. Finally, he is requested to state what he would like to be doing ten years from now.

From the evidence presented in Tables 3 and 4 it is apparent that the majority of the women are interested in teach-

TABLE 4
Tabulation of Stated Interests

	PRESENT CHOICE		CHOICE FOR TEN YEARS FROM NOW	
	Women	Men	Women	Men
1. Teaching	66	12	14	7
Secondary	33	12	—	—
Commercial Arts	15	0	—	—
Mathematics and Physical Sciences	2	4	—	—
Music, Art, Drama	7	3	—	—
Physical Education	2	3	—	—
Social Sciences	7	2	—	—
Elementary	33	0	—	—
2. Acting, Music	5	0	15	2
3. Business, Clerical	19	1	8	1
4. Journalism	1	1	1	1
5. Social Work	0	1	2	1
6. Marriage	0	—	33	—
7. Miscellaneous	3	0	21	3

ing for the time being at least. However, the answers to the question concerning vocational aspirations for ten years hence indicate that teaching was not looked upon as a permanent occupation. This fact was further substantiated by an analysis of certain items in the Strong Test itself. The seven items which related most directly to the marriage ambitions of the freshman women were taken from the test and a tabulation of responses made. These results are presented in Table 5. The evidence contained in this table shows rather conclusively that as far as this group of women is concerned marriage and home activities are more desired than success in a career which precludes marriage and the care of a home.

Individual conferences were held with each student who

TABLE 5

Tabulation of Responses to Items in Strong Inventory Pertaining to Marriage Ambitions

	L	?	D
1. Housekeeper	30	27	37
2. Wife	73	15	6
3. Teaching children	68	19	7
4. Have responsibility for care of new home	51	30	13
5. Follow own career after marriage	11	12	71
6. Be married with small income	41	31	22
7. Be married	75	13	6

requested that his inventory be scored. In these conferences abilities and opportunities were discussed as well as interests. The average conference required about a half hour per student and in some instances several conferences followed the initial one in which the interest ratings were discussed. Upon completion of the interview the writer evaluated the significance of the test results in the light of evidence gathered while conferring with the student. On the whole the interest ratings proved very helpful in discussing the individual's vocational problems. In many cases an elaborate study was made of the responses to specific items and in some instances the scores or letter ratings would have been of little value without the accompanying analysis of the test results. Inasmuch as vocational problems are discussed in the orientation course and various measuring instruments are mentioned in connection with such discussions, very few students had false impressions as to the significance of the interest ratings. Almost unanimously they looked upon the results as possible aids rather than final answers to their vocational problems.

From a study of the ratings themselves and the discussion of the ratings in the interviews a few observations concerning interest measurement as conducted by the Strong Inventory appear to be in order. First, it is quite apparent that all Teachers College freshmen do not look upon teaching as their life work. Both the Strong Inventory and the students' own

statements substantiate this conclusion. The majority of the young women are primarily interested in marriage and a home. Perhaps we should be happy rather than concerned about these findings. Teachers, particularly kindergarten and primary teachers, should have the normal interests of women of their age. The interest ratings in General Office Worker (correlating with Housewife .92) tend to show that in the Teachers College freshman class the majority of women have normal or average feminine interests as measured by the Strong Inventory.

Second, it appears that women are quite homogeneous in the interests which they exhibit, at least in so far as the Strong Inventory is able to measure them. The extremely small number of A ratings in occupations other than Nurse and General Office Worker tends to bear out this point.

Third, the men appear to be slightly more varied in their interests than are the women in this study. Also, they seem to be more definitely interested in education as a life work as shown by the fact that 10 of 15 men included in the study received B or better ratings in School Management.

Fourth, while the Strong Inventory does not give conclusive evidence concerning a student's vocational interests, it does throw considerable light upon vocational problems. The responses to individual items as well as the letter ratings are very useful in the individual interview. For this reason interest measurement appears to serve a useful function in college personnel work.

THE USE OF A SHORT PERSONALITY SCHEDULE IN HIGH SCHOOL PERSONNEL WORK

T. L. ENGLE

School Psychologist, Michigan City, Indiana

THE following brief report is part of a personnel study of 106 sophomores in the Isaac C. Elston Senior High School, Michigan City, Indiana. The mean age of the 55 boys in this group was 15.6 years; the mean age of the 51 girls was 15.3 years. An attempt has been made to study five problems: (1) Number and kind of social activities engaged in, (2) The relationship of such activities to scores on a personality schedule, (3) The relationship between self-expressed opinions of social adequacy and scores on a personality schedule, (4) Analysis of the feeling of being socially handicapped, (5) The relationship between personality schedule scores and the desire for social activities.

The subjects, constituting the entire 10(I) enrolment of the high school for the spring of 1938, were asked to fill out a short questionnaire and to answer the questions on the Willoughby (Clark-Thurstone) Personality Schedule. Papers were identified by numbers and no names were placed on them.

One of the questions on the questionnaire was: "Number of parties, dances, club, church, Scout, or other social meetings, not directly connected with the school, which you have attended during the past two weeks (Do not include movies)." Activities connected with the school were not included because in this school such activities for this group are very closely sponsored by the faculty members and are directly related to subject matter. Movies were not included because they may or may not be a social activity. Another question was: "How many dates (with a member of the opposite sex) have you had during the past two weeks? (This is to include any of the

previously mentioned activities engaged in as dates as well as any other dates, such as going to the movies.)"

A third question was:

> Place a check mark after the one statement which best describes your belief: (a) I believe that I am socially handicapped, that is, I find it difficult to take as active a part as I would like to take in social events which I attend; (b) I believe that I get along socially as well as the average person at social events which I attend; (c) I believe that I am unusually capable of meeting social situations at social events which I attend.

Hereafter persons answering this question in the various ways will be referred to as socially handicapped, socially average, and socially competent respectively.

The Willoughby Personality Schedule is so scored that the higher the score the greater are the neurotic tendencies indicated.

The data on the number and kinds of social activities engaged in during a period of two weeks and the mean personality schedule scores are given in Table I, such data being grouped under three headings. These data suggest that pupils believing themselves to be socially handicapped have fewer general social activities and fewer dates than those believing themselves to be socially average or competent. The scores on the Willoughby schedule seem to be a measure of something related to a feeling of being socially handicapped. The standard deviation in personality schedule scores for the 38 socially average boys was 13.6, and for the 41 socially average girls it was 14.3.

For further comparison the correlations between number of social activities and personality schedule scores were computed. Low scores were correlated against small number of activities. For all subjects this correlation was found to be $-.18 \pm .06$. A similar correlation was computed for number of dates and personality schedule scores, the result being $-.04 \pm .07$.

In order to secure some analysis of the feeling of being

TABLE I

Mean Numbers of Social Activities for a Period of Two Weeks and Mean Personality Schedule Scores of Subjects Differing in Social Adequacy

	SOCIALLY HANDICAPPED		SOCIALLY AVERAGE		SOCIALLY COMPETENT		ALL GROUPS		
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Both
Number of subjects	10	8	38	41	7	2	55	51	106
Mean number of general social activities	.90	1.75	2.03	4.02	5.86	3.50	2.31	3.65	2.95
Mean number of dates	.80	.88	1.26	2.00	3.00	4.50	1.40	1.92	1.65
Mean personality schedule scores	33.0	38.1	27.3	31.7	14.1	22.0	26.7	32.4	29.4

socially handicapped, mean scores for each of the 25 questions on the schedule were computed for each of the three groups. Differences in mean scores for the socially handicapped and socially average groups were computed and the questions were then arranged in rank order of difference of mean scores. The five questions giving the greatest differences were: "Do you keep in the background on social occasions? Are you self conscious before superiors? Do you often feel just miserable? Do you feel inferior? Do you get discouraged easily?" The mean scores on these questions for those believing themselves to be socially handicapped were 2.22, 2.33, 1.83, 1.38, and 1.66 respectively; for those believing themselves to be socially average the corresponding mean scores were 1.24, 1.48, 1.07, 0.72, and 1.07 respectively. For all five questions the scores for the nine subjects believing themselves to be socially competent were lower than for those believing themselves to be socially average. The five questions showing the least differences between the socially handicapped and socially average groups were: "Do you cry easily? Are you often lonely? If you see an accident does something keep you from giving help? Does it bother you to have people watch you work even when you do it well? Are your feelings easily hurt?" The mean scores for those believing themselves to be socially handicapped were 0.77, 1.11, 0.61, 2.05, and 1.33 respectively; for those believing themselves to be socially average the corresponding mean scores were 0.77, 1.07, 0.63, 2.03, and 1.35.

On the questionnaire, these two questions were asked: "Do you have a chance to attend as many social activities as you wish to attend? Do you have as many dates as you wish to have?" Thirty-eight boys and 37 girls stated that they had as many social activities as they wished to have, while 17 boys and 14 girls answered this question in the negative. Twenty-nine boys and 33 girls stated that they had as many dates as they wished to have while 26 boys and 18 girls answered this question in the negative. The mean number and kinds of social activities for boys and girls answering these two ques-

tions by Yes or No were computed. Also, the mean personality schedule scores for each group were found. These data are given in Table II.

TABLE II

Mean Number of General Social Activities, Mean Number of Dates, and Mean Personality Schedule Scores of Boys and Girls Indicating that they did or did not have as Many Social Activities and Dates as they Wished to Have

	ANSWER	MEAN NUMBER OF GENERAL SOCIAL ACTIVITIES OR DATES		MEAN PERSONALITY SCHEDULE SCORES	
		Boys	Girls	Boys	Girls
As many activities as desired?	Yes	2.97	4.03	24.84 ± 14.10	31.65 ± 13.70
	No	0.82	2.64	29.47 ± 11.50	35.86 ± 14.10
As many dates as desired?	Yes	1.21	2.39	27.49 ± 13.80	30.58 ± 14.20
	No	1.62	1.06	25.12 ± 12.80	41.61 ± 11.75

On the whole these data seem to indicate that those pupils who have as many general social activities and dates as they wish to have actually have more of these activities than those who do not have as many as they wish to have. Furthermore, the personality schedule scores of those pupils having as many general social and date activities as they wished are lower (better adjusted) than the scores of those not having as many social activities as they wished. Exceptions to these generalizations concerning social activities and schedule scores must be made in the case of boys' date activities.

Of course these data are based on groups too small to give reliable data. However, they are suggestive for any one engaged in high school personnel work. Further work needs to be done with various age groups for it is possible that results with different age groups might be quite different from the results reported here.

NEWS AND NOTES

WINGS FOR THE MARTINS is the title of a new Blue network series of everyday issues of education in drama form produced by the Educational Radio Division of the Office of Education, United States Department of the Interior. This series of 26 half-hour programs will be given every Wednesday night from 9: 30 to 10: 00, beginning November 16. Through the lives of the Martins, the teachers of their children, their school officials and their friends and neighbors, to-day's problems and the attack on those problems recommended by modern education will be quite literally brought "home." Seven initial programs will be: 1. Jimmy Runs Away, November 16; 2. Children Are Persons! November 23; 3. Everybody Joins a Club, November 30; 4. Let's Give Them Books, December 7; 5. Keeping the Family Well, December 14; 6. She Hasn't a Thing to Wear, December 21; 7. No Fun at Home! December 28. Months of research and planning under the direction of Assistant Commissioner Bess Goodykoontz have preceded the writing of scripts for WINGS FOR THE MARTINS.

THE PARENT PROBLEM is the title of an article by Garry C. Myers, of Western Reserve University, which appeared in the Parent Problem Column of a large number of newspapers in the United States and Canada in October, 1938. This article emphasizes the fact that many science teachers in high school and college make dogmatic statements, particularly concerning religious matters, which will cause a young person to feel that his parents and their teachings are ridiculous. There is no doubt that he suffers much embarrassment when he imagines what these "scholars," who are supposed to know everything, would think of him if they knew his parents and what they believed. He is often greatly influenced by these theories stated as facts, and many parents are hurt or angered when he expresses such "dangerous beliefs." Dr. Myers feels that a teacher can ill afford to shatter a student's religious faith, especially when the destruction takes with it this student's esteem for his parents. A good teacher will interpret all objective facts humbly, giving various points of view. He will not present theories as if they too were facts, thus possibly starting a mental hygiene problem with the student and his parents.

The Society for Research in Child Development of the National Research Council, Washington, D. C., through its several publications is widely known among scientific circles for its activities concerning all phases of child development. Through the *Abstracts* (bi-monthly) up-to-date information about current research and publications is available. The

journal *Child Development* (quarterly) contains specialized original articles in the various child fields. The following titles indicate the degree of specialization contained in these articles: "Studies in fetal behavior," "Anatomic lag," "The effect of improvement in nutrition on the mental capacity of children," "The effect of nutrition on the primary teeth," etc. This journal will appeal to specialists in keeping abreast with the best in scientific treatises. *Monographs of the Society for Research in Child Development* (one volume annually) consist primarily of detailed critical reviews and seriatim studies.

A recent announcement of publications on industrial relations by the Bureau of Industrial Relations of the University of Michigan lists the following which may be of interest to the readers of this Journal: "Education and Training Policy," by Lawrence A. Appley, Socony-Vacuum Oil Company. This appears in *Elements of Labor Policy*, Bulletin No. 7. "Wage Determination," by John W. Riegel, is a report of wage policies and practices with reference to labor market conditions, occupational duties and responsibilities, and fulfillment of the job by the individual employee. Samuel J. Lukens summarizes the discussions of executives at two conferences on the subject "The Selection and Development of Foremen."

The Seventh International Management Congress, held in Washington, D. C., from September 19–23, 1938, closed its sessions with an address by Charles H. Hatch, Chairman of the National Management Council of U. S. A., in which he traced the history and growth of the Congress from its first meeting held in Prague in 1924. That Congress, originating in the minds of leaders of management thought in the United States, revealed the best American Management practices in the hope that a greater common understanding among the leaders of industry and management in the countries of the world would not only improve management practices but also promote greater sympathy and tolerance among nations. Due to the interest aroused in the field of management there are now seventeen countries represented on the International Committee of Scientific Management. An American, William L. Batt, President of SKF Industries, Inc., of Philadelphia, is the new president of this Committee until the next triennial International Management Congress, which will be held in Stockholm, Sweden, in 1941. To Harry Arthur Hopf, President of H. A. Hopf and Company, of New York, was awarded the gold medal of the International Committee for services rendered to the management movement. Other officers include V. Lundvik of Sweden, Deputy President; to serve as vice-presidents are L. H. Ferasson of France; Thomas R. Jones, Elizabeth, N. J.; The Right Honorable Viscount Leverhulme of Great Britain; Pro-

fessor Th. Limperg, Amsterdam, Netherlands; Dr. F. Mauro of Italy; and George Seebauer of Germany.

The Department of Research and Test Service of the World Book Company has recently issued a report (Bulletin No. 38) of the Committee on Tests and Measurements of the Massachusetts Teacher Federation During 1935–36, including a platform for the use of standard tests. Here the Committee emphasizes ten points, the importance of which is too frequently overlooked. A number of tables clearly show who selects the tests, who administers tests, when are tests given, what pupils are tested (grades and number of towns in which all pupils were tested), who scores the tests, what achievement tests and intelligence tests are used, and why are tests given. It is noted that intelligence tests are given most frequently at the beginning of the year. They have become for many an indispensable instrument in educational guidance. Bulletin No. 38 may be secured upon application by persons interested.

The World Book Company has also recently published a "Normal Percentile Chart" for Arthur S. Otis, whose purposes are two-fold: first, to accomplish all the purposes of graphic representation and interpretation of the scores of a group, and second, to do so in the simplest and easiest manner. This Chart, a revision of the Universal Percentile Graph, has several very decided advantages over the Universal Percentile Graph and all similar charts.

A recent bulletin from the Office of Education, Department of the Interior, reports that there will be about 22,400,000 boys and girls in attendance at elementary schools this year; approximately 6,750,000 high school enrollments; about 1,350,000 young people in universities and colleges, and several million more will study in evening, part-time, vocational and emergency education classes. The traditional report card with its A's, B's, and F's is being supplanted in many schools by more complete reports to parents concerning the child's progress in school, his interests, dislikes, character traits, habits of learning, attention, and achievement. School-readiness tests, personal guidance, respect for each child's feelings and capabilities are doing much to put an end to a uniform type of education for every pupil.

In the year 1890 there were only about 200,000 pupils in high schools in the United States whereas in 1937–38 there were approximately 7,000,000. This shows the great holding power of our modern high school with its hundreds of different courses developed to appeal to the wide cross-section of American youth. While elementary school enrollments have dropped in the past few years, the rise in high-school enrollments offset the lower-

grade decreases until 1934–36, when, for the first time in the history of the nation, the total enrollments in America's public elementary and secondary schools showed a decline. Vocational schools throughout the country will enroll more than 2,000,000 youth and adults this year. A newly organized Office of Education occupational information service will endeavor to supply much needed data regarding job opportunities, training needs, and the like. Of the 65,000 new enrollees who will enter the CCC Camps on October 1, it is predicted that about 57,000 will be enrolled in educational classes of one kind or another. Of the more than 1,000,000 teachers who will teach this year nearly 100,000 will be newcomers. The average salary paid city school teachers is $1,818 per year; rural school teachers, $827 per year. Qualifications for teaching positions are constantly being raised in most of the States.

The National Occupational Conference, 551 Fifth Avenue, New York, has recently published an appraisal and abstract of available literature on each of a number of different occupations including: architect, advertising, accountant, journalism and general houseworker. These abstracts are prepared under the general supervision of Robert Hoppock, Assistant to the Director of the National Occupational Conference. The publication of these pamphlets is made possible by a grant from Carnegie Corporation of New York. For further information about occupations consult the *Occupational Index*. For information about vocational and educational guidance see *Occupations*, the *Vocational Guidance Magazine*. Both are published by the National Occupational Conference.

BOOK REVIEWS

RUTH STRANG. *An Introduction to Child Study.* Revised edition. New York, The Macmillan Company. 1938. xv + 681 p.

This revision of Dr. Strang's well-known and most valuable *Introduction to Child Study* has most definitely been brought up-to-date. Seventy-five per cent of the research studies directly referred to and ninety per cent of the selected reading bibliographies are dated since 1930 when the first edition was published. This new material has been skillfully fitted into the solid background of the earlier volume.

For those who may be unfamiliar with Dr. Strang's earlier work, an outline of the contents of this volume will be useful. The five parts, each including several chapters, describe the "roots of behavior," and then in order the infancy, pre-school, primary, pre-adolescent, and adolescent periods. For each age period the author systematically, but lucidly, discusses the questions of development, learning, special problems, and methods of study and guidance. In every possible way the author makes her discussion practical, concrete, and specific, without ever losing sight of the scientific work which she is interpreting.

According to the author "this book is designed to orient those who are planning to continue their study in the field of child development and guidance and to supply the minimum essentials to parents and teachers and others who have or will have in the future responsibility for the education of children." In the light of this statement of purpose of the author, the reviewer can say nothing higher in commendation than "a job well done."

C. M. LOUTTIT,
Indiana University.

T. N. WHITEHEAD. *The Industrial Worker.* Cambridge: Harvard University Press, 1938. 2 vol., pp. xiv + 264, vii + 181.

These two volumes mark twelve years of work, according to the foreword. Six years were spent on actual observation and experimentation, and another six years on the analysis and interpretation of the data. The present volumes supplement the writings of other authors on this same experiment: Mayo, Pennock, and Putnam, to mention but a few.

A special group of five girl workers, relay assembly operators, was placed in an experimental room of the Hawthorne Plant of the Western Electric Company. An orderly investigation was then made over a period of years, with the effect of such variables as the length of the working day being observed primarily in terms of output.

To briefly summarize some of the findings as reported by Dr. Whitehead, rates of output failed to correlate with daily or weekly hours of rest at night. Holidays decreased working rates on following days, as was the case with weekends. Changing the type of relay had little effect on the rate of experts, and but a slightly adverse effect on novices. Temperature and humidity, whether considered outside the plant or inside the workroom, had little effect on output rate compared with the changes of output rate that were commonly being experienced. Output was found to be slightly related to physical feeling, inasmuch as there was a small decrease during menstrual periods. In general, it was the social situation that most greatly influenced output. The operators reacted to one another, and to the group. The girls reacted to the whole situation in terms of human relations.

Of course such a brief presentation of the results does a great injustice to Dr. Whitehead's piece of work. The book shows an excellent organization, and a clear, readable style. The statistical work is well presented, and the many tables and charts are presented in detail in Volume II, with the text in Volume I. In this way, the reader can read the material in Volume I, following the charts in Volume II as he reads along. Although it is not desirable from the standpoint of clear understanding, the reader can thus omit all of the detailed charts and tables from consideration, if he so desires. For the casual student in the field, of course, this is a very desirable feature.

A few of the chapters which present discussions of results have conclusions stated in just so many words, presented in numerical order at the end of the chapter. This is not the case however, with all of the chapters, so that just when one has become used to a sort of resumé, this technique is eliminated. Since these summaries are so helpful, it seems unfortunate that Dr. Whitehead did not continue them throughout the book.

In general, however, the book is an admirable presentation of the results of the Hawthorne work. Since the entire investigation so definitely shows the relatively greater importance of social relationships over mere physical factors, such as temperature, working conditions, etc., the book should be of great interest to psychologists. When a professor of industry shows that the psychologist must be more important than the industrial engineer in an industrial situation, that is news! The industrial expert, the manager, executive, and personnel worker will take notice of this book, so certainly the psychologist at all interested in industry should do likewise. Students of all these fields will find the book a useful reference to a notable investigation.

ALBERT B. BLANKENSHIP,
Psychological Corporation.

MANDEL SHERMAN. *Mental Conflicts and Personality.* New York, Longmans, Green and Co., 1938. vii + 319. $2.25.

In a lucid style, Dr. Sherman presents the rôle of mental conflicts in human behavior. Drawing upon his wide experience with problem children and neurotic adults and scrutinizing the experimental literature, he evaluates current theories and in effect develops a system of personality.

The development of personality depends upon conflicts. Conflicts must necessarily arise because society introduces problems, frustrations, taboos, etc. Not all conflicts are undesirable. Since behavior is motivated by conflicts, many conflicts must be beneficial and valuable. In his definitions of conflict and personality, the author shows keen observation of and insight into the processes of mental activity. A conflict is a pattern of mental activity characterized by unpleasant emotional attitudes. In these attitudes one finds discrepancy between desires and acceptance of the social restrictions to their satisfaction, or between two incompatible desires. Personality is not defined in the usual way. Sherman gives it a conceptual meaning. It indicates the formation of characteristics patterned in definite groups. It indicates the integration of a wide variety of characteristics. One important function is to maintain adjustment to the environment.

Chapter I is a discussion of the origin, development, and nature of conflicts. This discussion brings out the arousal of conflicts because of the problems inevitably produced by society, the growth of conflicts dependent themselves upon the growth and maturity of the individual, the effects of conflicts upon normal as well as abnormal individuals, and the function of personality. The question why some adjust normally and others develop neuroses, anxieties, etc., because of conflicts, is left unanswered except to recognize the possibility of constitutional differences.

The relationship between attitudes and conflicts is thoroughly discussed in the second chapter. Attitudes are required in complex society. Otherwise, every single instance of behavior involves detailed attention and the arousal of conflicts. Attitudes may be looked upon as preparatory reactions for behavior. Attitudes, themselves, arise from previous conflicts and problems. A good point is made when the author writes that attitudes are difficult to change because they were determined by conflicts, and the conflicts resist easy alteration. Although intelligence is not supposed to play an important part in the formation of attitudes, higher intelligence does make for more ability to change attitudes.

In Chapters III, IV, and V, Dr. Sherman describes culture conflicts, conflicts of inferiority and insecurity, and sex conflicts. The causes, development, and treatment of these conflicts are simple to comprehend because of the frequent citations of case material to support the contentions or to illustrate the explanations offered.

The last two chapters include the material on conflicts and neuroses, and conflicts and antisocial behavior. There is a difference between the conflicts of the neurotic individual and the person who is well adjusted. In the latter, the conflicts do not involve issues which influence his daily behavior. In the neurotic they disturb and interfere with the routine of every-day behavior. The neurotic's conflicts are highly systematized. The emphasis upon conflicts as the origin of much conduct disorder came with the advent of psychoanalysis. The conflicts of behavior disorder have greater driving force than the conflicts of children who manage to adjust in socially acceptable ways.

One can disagree with many of the views expressed in this book and yet find much of value. It is rich with demonstrative case material which certainly seems to fit the beliefs expressed by the author. Those working with children who desire a treatment of personality and conduct above the elementary level will find the book excellent. The student of personality will be refreshed to read of personality with little mention of the traditional traits and measurements usually found in such books.

SYDNEY ROSLOW,
Psychological Corporation.

NEW BOOKS AND PAMPHLETS RECEIVED

Books and pamphlets for review should be sent to James P. Porter, Editor, JOURNAL OF APPLIED PSYCHOLOGY, Ohio University, Athens, Ohio.

The Behavior of Organisms. B. F. SKINNER. D. Appleton-Century Company, New York, 1938. $5.00. 457 pp.

Children with Delayed or Defective Speech. SARA M. STINCHFIELD AND EDNA HILL YOUNG. Stanford University Press, Stanford University, California, 1938. $3.00. 174 pp.

Experimental Psychology. ROBERT S. WOODWORTH. Henry Holt & Company, New York, 1938. $3.80. 889 pp.

General Anthropology. FRANZ BOAS, Editor. D. C. Heath & Company, New York, 1938. $4.00. 718 pp.

The Genesis of Poor Reading. CHESTER C. BENNETT. Bureau of Publications. Teachers College, Columbia University, New York City, 1938. $1.60. 139 pp.

Genetics. HEBBERT EUGENE WALTER. Macmillan Company, New York, 1938. $3.00. 412 pp.

Guiding Human Misfits. ALEXANDER ADLER. Macmillan Company, New York, 1938. $1.75. 88 pp.

Introduction to Methods in Experimental Psychology. MILES A. TINKER AND KENNETH H. BAKER. D. Appleton-Century Company, New York, 1938. $2.75. 222 pp.

Modern Society and Mental Disease. CARNEY LANDIS AND JAMES D. PAGE. Farrar & Rinehart, New York, 1938. $1.50. 190 pp.

Persisting Behavior of Kindergarten Children. THETA HOLMES WOLF. University of Minnesota Press, Minneapolis, Minn., 1938. $2.00. 138 pp.

Psychological Factors in Marital Happiness. LEWIS M. TERMAN. McGraw-Hill Book Company, New York, 1938. $4.00. 474 pp.

Psychological Foundations of Personality. LOUIS P. THORPE. McGraw-Hill Book Company, New York, 1938. $3.50. 602 pp.

The Psychologist at Work. M. R. HARROWER. Harper & Bros., New York, 1938. $1.00. 184 pp.

Psychology in Everyday Living. FRANCIS F. POWERS, T. R. MCCONNELL, BRUCE V. MOORE AND CHARLES E. SKINNER. D. C. Heath & Company, New York, 1938. $2.75. 511 pp.

Radicalism-Conservatism in Student Attitudes. ERLAND NELSON. Psy-

chological Monographs, Vol. 40, No. 4, 1938. Psychological Review Company, Ohio State University, Columbus, Ohio. 32 pp.

The Rediscovery of Man. HENRY C. LINK. Macmillan Company, New York, 1938. $1.75. 257 pp.

Relationships between Young Sisters as Revealed in Their Overt Responses. MARGARET B. MCFARLAND. Bureau of Publications, Teachers College, Columbia University, New York, 1938. $3.50. 230 pp.

Resumption of Interrupted Activities by Pre-school Children. EVELYN KATZ. University of Minnesota Press, 1938. $1.50. 52 pp.

Social Psychology. DANIEL KATZ AND RICHARD L. SCHANCK. John Wiley & Sons, New York, 1938. $3.75. 700 pp.

Those Who Influence and Those Who Are Influenced in Discussion. RAY H. SIMPSON. Bureau of Publications, Teachers College, Columbia University, New York, 1938. $1.60. 89 pp.

A Visual Motor Gestalt Test and Its Clinical Use. LAURETTA BENDER. Research Monographs, No. 3. American Orthopsychiatric Association, New York, 1938. 176 pp.

You Can Sleep Well. EDMUND JACOBSON. McGraw-Hill Book Company, New York, 1938. $2.00. 269 pp.

Youth and the World's Work. JAMES H. BEDFORD. Society for Occupational Research. University of Southern California, Los Angeles, California, 1938. 140 pp.

Directory of American Psychological Periodicals

(Continued)

Journal of Comparative Psychology—Baltimore: The Williams & Wilkins Co. Subscription $5.00 per volume of 450 pages. Two volumes every year. Edited by Knight Dunlap and Robert M. Yerkes. Founded 1921.

Comparative Psychology Monographs—Baltimore: Johns Hopkins University Press. Subscription $5.00. 400 pages per volume. Knight Dunlap, Managing Editor. Published without fixed dates, each number a single research. Founded 1922.

Genetic Psychology Monographs—Provincetown, Mass.: The Journal Press. Subscription $7.00 per volume. One volume per year. Edited by Carl Murchison and an international cooperating board. Quarterly. Each number one complete research. Child behavior, animal behavior and comparative psychology. Founded 1925.

Psychological Abstracts—Ohio State University, Columbus, Ohio: American Psychological Association. Subscription $7.00 a year ($7.25 foreign). 700 pages ann. Edited by W. S. Hunter. Monthly. Abstracts of psychological literature. Founded 1927.

Journal of Genetic Psychology—Provincetown, Mass.: The Journal Press. Subscription $14.00 per annum; $7.00 per volume. 1,000 pages annually (2 volumes). Edited by Carl Murchison and an international cooperating board. Quarterly. Child behavior, animal behavior, and comparative psychology. Founded 1891.

Journal of Social Psychology—Provincetown, Mass.: The Journal Press. Subscription $7.00. 300–600 pages annually. Edited by John Dewey, Carl Murchison, and an international cooperating board. Quarterly. Political, racial, and differential psychology. Founded 1929.

Personnel Journal—Baltimore: The Williams & Wilkins Co. Subscription $5.00. 500 pages, approximately. Edited by Walter V. Bingham. Bi-monthly.

Mental Measurement Monographs—Baltimore: The Williams & Wilkins Company. Subscription $5.00. 400 pages annually. Edited by Knight Dunlap and Buford Johnson. Published without fixed dates, each number a single research. Founded 1925.

Studies in Psychology and Psychiatry—Baltimore: The Williams & Wilkins Company. Subscription $5.00. 400 pages annually. Edited by Edward A. Pace. Published without fixed dates, each number a single research. Founded 1926.

Journal of Educational Psychology—Baltimore, Md.: Warwick & York. Subscription $6.00. Edited by Jack W. Dunlap, Harold E. Jones, and Percival M. Symonds. Published monthly except June to August. Founded 1910.

Child Development—Baltimore, Md.: Williams & Wilkins Company. Subscription $5.00. 400 pages annually. Edited by Buford Johnson. Quarterly. Founded 1930.

Character and Personality—Durham, N. C.: Duke University Press. Subscription $3.00 per annum. Quarterly. Published simultaneously in Great Britain and the United States. Edited by Charles E. Spearman (London) and Karl Zener (Duke University). Founded 1932.

Journal of Psychology—Provincetown, Mass.: The Journal Press. Subscription $14.00 per annum; $7.00 per volume. 1000–1200 pages annually. Immediate publication for any accepted manuscript. Edited by Carl Murchison and an editorial board. Quarterly. The general field of psychology. Founded 1935.

Leaders of American Psychological Periodicals

American Journal of Psychology—Ithaca, N. Y.: Cornell University. Subscription $6.00. 624 pages annually. Edited by K. M. Dallenbach, M. F. Washburn, M. Bentley, E. G. Boring. Quarterly. General and experimental psychology. Founded 1887.

Journal of General Psychology—Provincetown, Mass.: The Journal Press. Subscription $14.00 per annum; $7.00 per volume. 1000 pages annually (2 volumes). Edited by Carl Murchison and an international cooperating board. Quarterly. Experimental, theoretical, clinical, and historical psychology. Founded 1927.

Psychological Review—Ohio State University, Columbus, Ohio: Psychological Review Company. Subscription $5.50 (Foreign, $5.75). Single copies, $1.00. 500 pages annually. Bimonthly. Original contributions only. Edited by Herbert S. Langfeld. Founded 1894.

Psychological Monographs—Ohio State University, Columbus, Ohio: Psychological Review Company. Subscription $6.00 per vol. 500 pages. Edited by John F. Dashiell. Published irregularly, each issue one or more researches. Founded 1895.

Psychological Index—Ohio State University, Columbus, Ohio: Psychological Review Company. Subscription $4.00. 300–400 pp. Edited by W. S. Hunter and R. R. Willoughby. An annual bibliography of psychological literature. Founded 1895.

Psychological Bulletin—Ohio State University, Columbus, Ohio: Psychological Review Company. Subscription $6.00. 720 pages annually. Psychological literature. Monthly (10 numbers). Edited by John A. McGeoch. Founded 1904.

Archives of Psychology—New York: Columbia University. Subscription $6.00. 500 pp. ann. Ed. by R. S. Woodworth. Published without fixed dates, each number a single experimental study. Founded 1906.

Journal of Abnormal and Social Psychology—Ohio State University, Columbus, Ohio; American Psychological Association. Subscription $5.00. Foreign, $5.25. Editor, Gordon W. Allport. Quarterly. 500 pages annually. Abnormal and Social. Founded 1906.

Psychological Clinic—Philadelphia: Psychological Clinic Press. Subscription $3.00. 300 pages. Ed. by Lightner Witmer. Without fixed dates (Quarterly?). Orthogenics, psychology, hygiene. Founded 1907.

Psychoanalytic Review—Washington (D.C.): 3617 19th St., N.W. Subscription $6.00. 500 pages annually. Psychoanalysis. Quarterly. Ed. by W. A. White and S. E. Jelliffe. Founded 1913.

Journal of Experimental Psychology—Ohio State University, Columbus, Ohio. Monthly; two volumes per year. Subscription, consisting of six numbers containing about 600 pages. Experimental psychology. $14.00 ($7.00 per volume). Edited by W. S. Foster and W. Fernberger. Founded 1916.

Journal of Applied Psychology—Lancaster, Pa.: Science Press Printing Co. Subscription, $6.00. 500 pages annually. Bimonthly. Edited by James P. Porter, Ohio University, Athens, Ohio. Founded 1917.

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